THE MAGAZINE OF

Standards

The Role of Standards in

50 YEARS OF FOOD AND DRUG CONTROL *(page 296)*

OCTOBER 1956

THE MAGAZINE OF

Standards

October, 1956 Volume 27, No. 10

In This Issue

Published monthly by the
American Standards Association, Incorporated
70 East Forty-fifth Street, New York 17, N. Y.

Officers
H. Thomas Hallowell, Jr, *President*
Vice Admiral G. F. Hussey, Jr, USN (Ret), *Managing Director and Secretary*
Cyril Ainsworth, *Technical Director and Assistant Secretary*

Ruth E. Mason, *Editor* Sheila Dressner, *Art and Production Editor*

Single copy 60¢. $7.00 per year (foreign $8.00). Schools and libraries $5.00 (foreign $6.00). This publication is indexed in the Engineering Index and the Industrial Arts Index. Re-entered as second class matter Jan. 25, 1954, at the Post Office, New York, N. Y., under the Act of March 3, 1879.
Opinions expressed by authors in THE MAGAZINE OF STANDARDS *are not necessarily those of the American Standards Association.*

Marginal Notes

American Standards —

On the eve of the Seventh National Conference on Standards it may be of interest to note that the most recent price list of American Standards shows a total of 1630 specifications, methods of test, dimensional requirements, building code requirements, and safety standards approved as American Standard. The procedure of the American Standards Association inquires into the competence of those who have developed a standard, and into the degree of representation of groups concerned, not into the technical content of the standard. Therefore, the status of "American Standard" is certification of general acceptance, and American Standards offer a basis on which to build with assurance that others concerned have had a part in their development. That American Standards play an important role in industry today was shown in the number of times they were brought into discussions during the Fifth Annual Meeting of the Standards Engineers Society at Washington, October 2-5. (For a report of the meeting, see the next issue of THE MAGAZINE OF STANDARDS.)

Exhibits at the Seventh National Conference on Standards will emphasize how much company members receive from membership in the American Standards Association in relation to the small amount membership costs.

Miniaturization —

Miniaturization is the theme stressed recently by ASA's President, H. Thomas Hallowell, Jr (President, Standard Pressed Steel). "Miniaturization is not a philosophy of less and less," he says. "It signifies more and more—more function, more service, more utility per unit of material, time, or cost." Everyone concerned with this subject will be interested in the fact that a number of sectional committees under ASA procedure are also stressing miniaturization. Miniature

screw threads are featured in THE MAGAZINE OF STANDARDS this month (page 300). Now, committees are also working on instrument ball bearings, a large portion of which are necessarily in the miniature field. Proposals on these bearings were returned to committee B3 for further study and coordination at a meeting last month.

Documation —

THE MAGAZINE OF STANDARDS is included in the new publication, *Documation*, which previews contents pages of more than 100 magazines of interest to management. Categories covered are administration; advertising, marketing and sales; automation; business; documentation; financial management; general management; industrial engineering; manufacturing and plant management; office management; operations research; personnel management; and research management.

Oops, Sorry!

Through some mix-up in information, the caption given one of the illustrations in the September issue referred to "A transistor and a radio tube of the type it may replace." A closer look shows the "transistor" to be a diode. The editors' thanks to those who spotted this error and called attention to it.

The Front Cover —

The cracker barrel era was in full swing in the early days of our first pure food and drug law. The fiftieth anniversary of this history-making law is being celebrated this year (see page 296). In the cover picture, the man with the badge (at right) is an FDA inspector getting samples in a typical "supermarket" of 1912.

This Month's Standards Personality

HENRY B. DUFFUS is an electrical engineer who has made good in safety engineering. As Accident Prevention Administrator for the Westinghouse Electric Corporation, he coordinates corporation policies and procedures as they relate to the prevention of accidents, and serves as a consultant in accident prevention to the operating personnel and safety supervisors at 98 locations throughout the United States. Having started his work on safety in 1927, he is a member of the "Veterans of Safety."

The nationwide scope of his company activities sparked Mr Duffus' interest in the American Standard safety work. He has not only served as a member — and chairman — of several committees but also as both vice-chairman and chairman of ASA's Safety Standards Board. For five years he has been chairman of the committee responsible for the widely used American Standard for compiling and recording accident statistics, Z16, and of committeee B11, on safety for power presses and foot and hand presses.

His interest in nationwide industrial safety brought Mr Duffus the honor of election as first vice-president of the American Society of Safety Engineers. He is an outstanding member of the National Safety Council, a member of the Board of Directors and of the Industrial Conference Executive Committee, and past chairman of both the Automotive and Machine Shop Section and the Electrical Equipment Section.

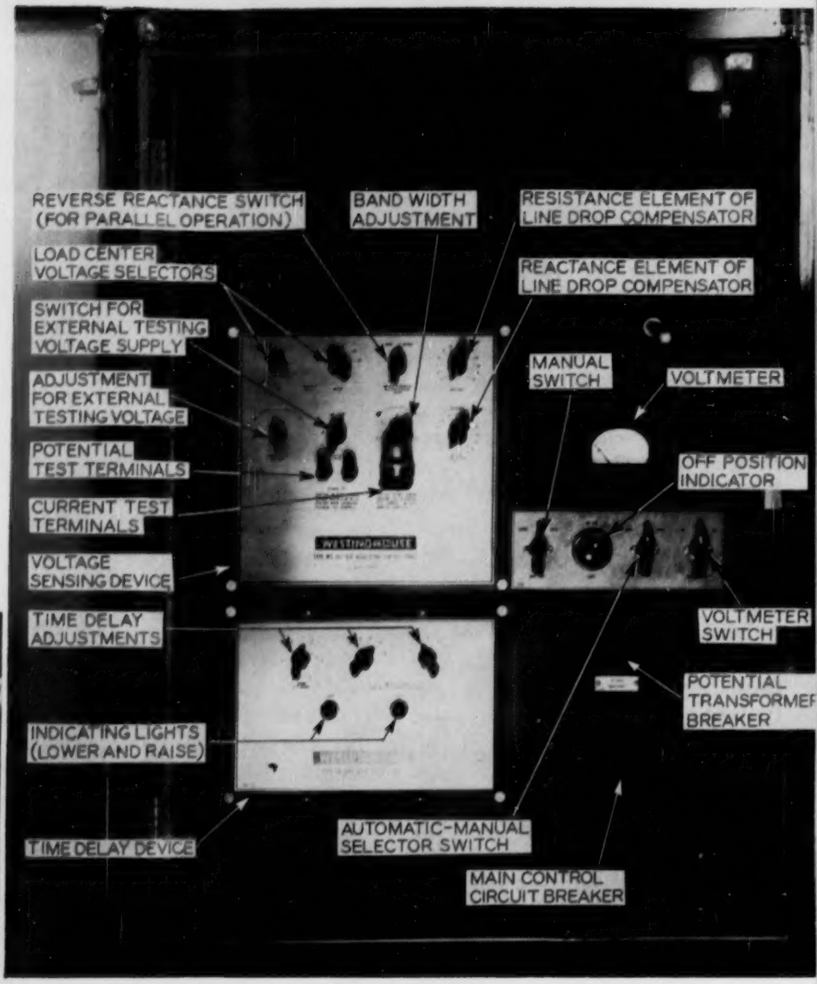
Mr Duffus was born in Perth, Scotland. He came to the United States in 1913 but during World War I returned to Scotland and enlisted in the British Army. After the war he was repatriated to the United States.

He was graduated from the Bliss Electrical School at Washington, D. C., in 1923. The same year he joined Westinghouse on the engineering test floor at their East Springfield Works. In 1927 he was appointed supervisor of inspection and test of the newly formed radio division at Chicopee Falls, Mass. Included in this assignment was his first responsibility for safety, as plant safety engineer. This was followed in 1935 by appointment as safety engineer at the East Springfield Works, and in 1941 by transfer to the corporation headquarters in Pittsburgh. Here he assumed over-all responsibility for the corporation's safety activities.

Mr Duffus has been awarded the Silver Beaver for his work as chairman of the activities committee of the Allegheny Council of the Boy Scouts of America.

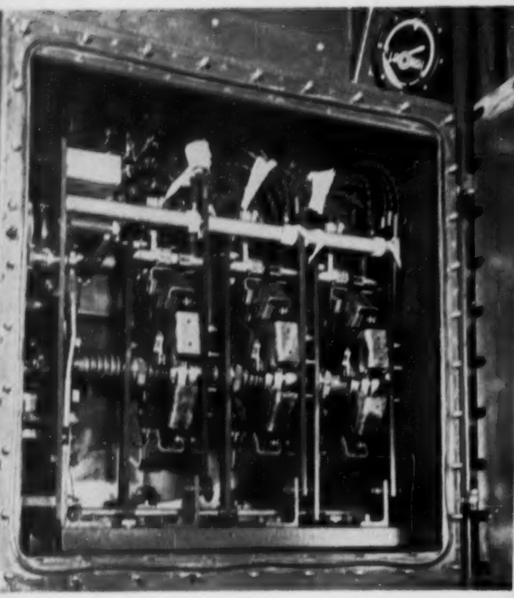
His major summer diversion is commuting between Pittsburgh and the Thimble Islands off the Connecticut Coast. Between swimming and relaxing, he continues to remodel his summer cottage on Money Island.

The Duffuses have two children and four grandchildren. "Their grandparents can conveniently spoil" Ruth's two children, Mr Duffus says. However, Bob, a graduate of Carnegie Tech, is a second lieutenant in the Corps of Engineers at Fort Lewis, Tacoma, Washington, and his two children "are just far enough away that they can't be spoiled by their grandparents."



2

1



3

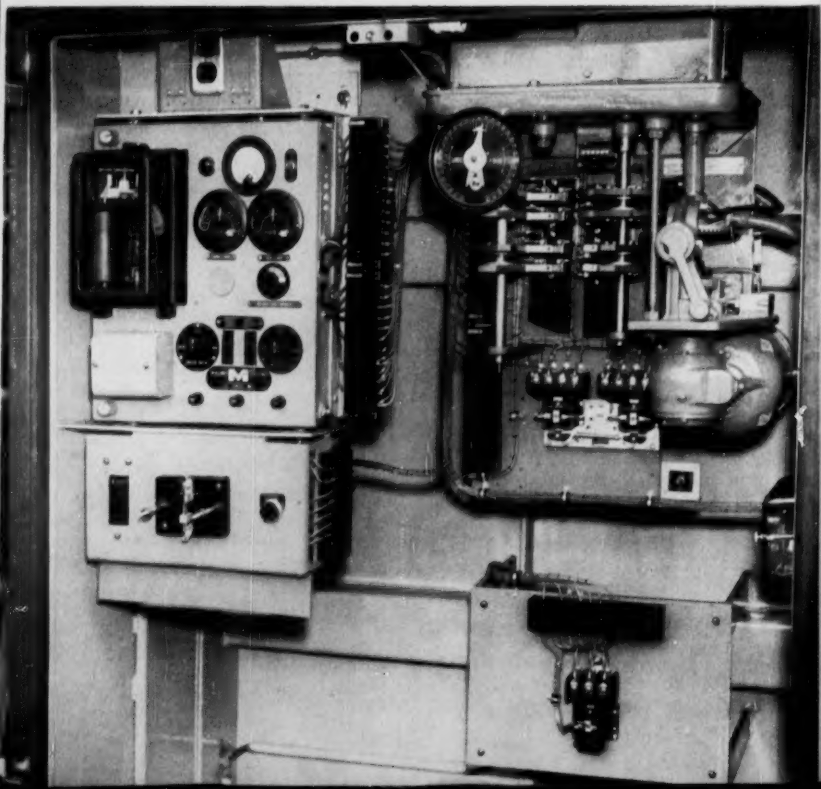


Figure 1
Load-tap-changing mechanism mounted in compartment

Figure 2
Typical control panel for LTC transformer

Figure 3
LTC transformer showing control and tap position indicator

Pictures were supplied by General Electric Company, Westinghouse Electric Corporation, Maloney Transformer Company, Pennsylvania Transformer Company, and Allis-Chalmers Company.

Users' needs considered in new work on

TRANSFORMERS

by H. M. JALONACK

Chairman ASA C57 Subcommittee on Power and Distribution Transformers. Recently retired from General Electric Company's Distribution Transformer Department, where he was manager of marketing research and product planning, Mr Jalonack is continuing to serve as chairman of the C57 subcommittee.

THE practical application of electric energy to its many uses in industry, in agriculture, and in the home requires the availability of transformers of many sizes, voltages, and types. For each additional kilowatt generated annually in the United States something like 4 to 5 kilovolt amperes of stepdown and stepup power transformers, and approximately 2 to 2½ kva of distribution transformers must be produced to handle the transmission, sub-transmission, and distribution of electric energy at the most efficient levels. The orderly and economic production of such transformers in accordance with United States needs is greatly enhanced by sound standards. For this reason, standards for stepup and stepdown power transformers and distribution transformers comprise important subdivisions of the scope of the C57 Sectional Committee. Basic standards have been available in the C57 series of American Standards for many years. Standards, however, do not remain static in any field, particularly in one as dynamic as equipment supplying electricity for light and power requirements.

Several years ago it was decided to make a complete review of American Standards covering power and distribution transformers with the objective of eliminating outdated items and incorporating changes and additions indicated by the development of the transformer art and of users' needs. Such a review has now been completed under the specific guidance of the C57 subcommittee assigned to this section. Recommendations have been officially approved by ballot and by the Electrical Standards Board of ASA, and very shortly there will be available an up-to-date section including terminology, general standards, and test procedures covering the complete range of ratings.

Certain power transformer sizes, particularly three-phase units 10,000 kva and smaller with high-voltage rating of 67,000 volts and below and with low-voltage rating of 15,000 volts and below are in sufficiently wide use so that in addition to these general requirements applying to all ratings of transformers, many construction features, mechanical, electrical, and thermal can be standardized in detail. The same applies to an equal or greater extent to distribution transformers where the actual number of units is substantially greater than that of power transformers and where complete transformers are often built on a production line basis. The widespread development and general acceptance of American Standards in these high use items has saved, and continues to make possible savings of, many millions of dollars annually.

The new section C57.12-1956, soon to be made available, covers construction standards on single- and three-phase power transformers in the kva and voltage ratings mentioned in the preceding paragraph. An important feature of these standards is the optional choice of certain constructional and rating features, particularly where such options do not appreciably change the construction of the basic standard unit. In this way the standard product can be broadly utilized with sufficient flexibility in choice of features to meet not only normal requirements but also many specific needs of the users.

In the process of balloting is a new standard on distribution transformers covering pole-type transformers 500 kva and smaller. Other distribution transformer standards under development are the network and subway types. In the distribution transformer area, the ASA C57 subcommittee works very closely with the Edison Electric Institute-National Electrical Manufacturers Association Joint Committee on Standards for Distribution Transformers, an able and long-standing standardization group.

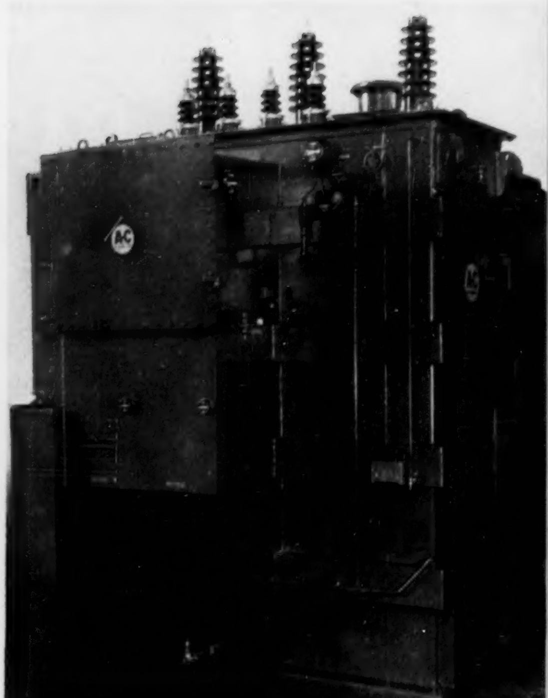
Before most of these newly developed equipment requirements are eligible to become an American Standard, it is customary to have a trial-and-use period in which the requirements appear as a Proposed American Standard. Such a period

allows desirable changes and additions to come to light for incorporation into the final standard. An excellent example of this method in action is exemplified by the Proposed American Standard on three-phase power transformers 10,000 kva and smaller, 67,000 volts and below with automatic self-contained voltage-regulating means, now officially termed Load-Tap-Changing Transformers (LTC). This proposed standard was published for trial use in August of this year and after a suitable period it will be included as Section 30 of C57.12 with such revisions as have been approved. It seems desirable to review briefly the reasons for the development of LTC standards and for some of the specific requirements included in the standard.

The automatic maintenance of a good voltage level is desirable for all applications—industrial, agricultural, and in the home. There are several ways of obtaining this desired voltage regulation; by bus or feeder regulators, by regulator and capacitor combinations, by generator field control, etc. However, in recent years a rapidly growing method has been the incorporation in the transformer itself of a means of automatically changing the voltage in small increments while the transformer is under excitation and carrying load. Although individual manufacturers of such transformers have had their own construction standards, there has been no general unanimity of basic general requirements or constructional specifications such as an American Standard can provide. This lack acted as a handicap to users desiring interchangeability of equipment as well as to manufacturers who desired to produce such equipment consistently, economically, and without numerous and costly variations in drawings, tools, and fixtures.

The following important construction features are included as standard requirements in the newly proposed standard:

Tap Changing—Operating experience in this field has shown that a tap-changing mechanism capable of raising or lowering the output voltage 10 percent takes care of almost any normal requirement. While occasionally a lower percent range is adequate, the advantages of simplification by the avoidance of too many different types outweigh any small savings possibly obtainable with the lower tap range. Experience has also demonstrated that this 20

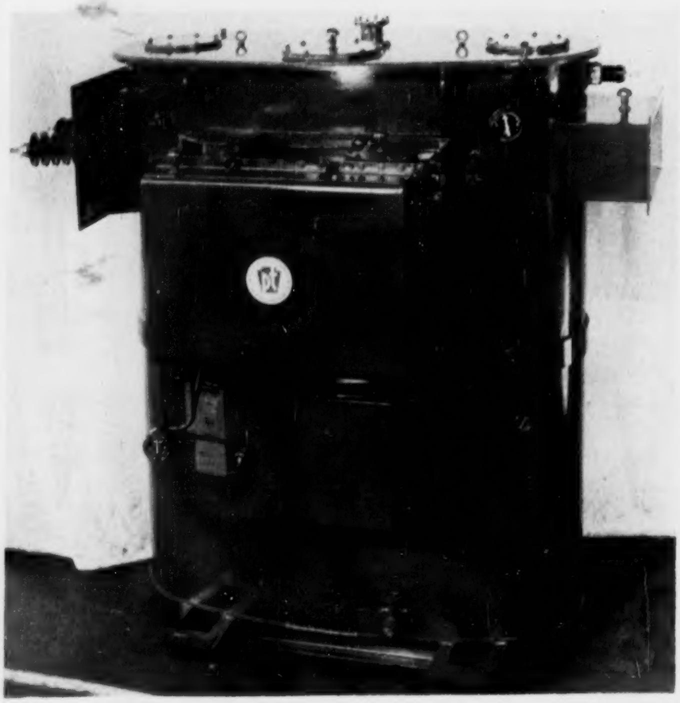


4

Figure 4
Complete LTC transformer showing tank and compartment construction

Figure 5
LTC transformer equipped with high- and low-voltage junction boxes

Figure 6
Typical LTC transformer showing LTC mechanism and control panel



5

percent adjustment can, for all practical purposes, be smoothly made in 32 steps of $\frac{5}{8}$ percent each, half of them utilized for raising and half for lowering the output voltage. An example of this load-tap-changing mechanism as produced by one manufacturer is shown in Figure 1.

Control—Obviously, for automatic operation the load-tap-changing mechanism must be actuated by an accurate and sensitive control together with its attendant relays, means of adjustment, indicating, and protective devices. Such requirements have been carefully delineated in the proposed standard. For example, the automatic control equipment accuracy is specified as Class 1 which is the highest order of accuracy and is defined in detail in American Standard C57.15-1949. It was also necessary to specify in the LTC standard the accuracy class of the potential source required for the automatic control since this source is supplied by the user.

Another important feature incorporated in the control requirements is the provision for operating several LTC transformers in parallel with each other. Since this was an area where a considerable divergence existed between manufacturers, this required a substantial amount of study and some revision of existing practices.

Many of the details of the control mechanism are illustrated in Figures 2 and 3.

Tank Construction — The housing of the main transformer, of the tap-changing mechanism, of switching and control compartments, some liquid-filled and some dry, required considerable study during the development of the proposed standard. The same methods of oil preservation are specified as in the C57.12 standard on conventional power transformers but the several optional oil preservation methods have been eliminated because of the inherently more complicated structure of the LTC transformers.

6

Since the actual changing of taps under load-carrying conditions involves arcing and some gas generation, it is necessary to specify venting means for such gas and the sealing-off of such arcing switch compartments from the main tank.

Other tank features include draining and filtering facilities, removable covers, hinged where weight requirements dictate, adequate manhole provisions, tank-grounding arrangements, pressure relief devices and the necessary instrumentation for reading liquid level, liquid temperature, pressure-vacuum, position of the load-tap-changer, etc. A view of a typical LTC tank is shown in Figure 4.

Other Features — Space does not permit enumerating many of the other requirements included. For example, the proposed standard contains complete kva and voltage levels of standard units, standard tests required, impedance standards, dimensions of bushings and many other necessary operating and construction features. Figures 5 and 6 show additional views of typical units conforming to the proposed standard.

Application — Although this proposed standard does not yet have the status of a full American Standard, its requirements have been carefully developed and it is believed that not many changes or additions will be made in essential features before its consideration by ballot as a full American Standard. Until such approval has been given, the Sectional Committee on Transformers recommends the proposed standard with the assurance that equipment conforming to the standard will be both practical as to use, and economical as to manufacture.

Dr Harvey W. Wiley weighing food for his "Poison Squad"—a group of human volunteers who made history in the world's "most famous boarding house." The Poison Squad experiments went on for approximately five years beginning in 1903.

Bureau of Chemistry food laboratory half a century ago —Harvey W. Wiley at work.

The Role of

50 Years of Food

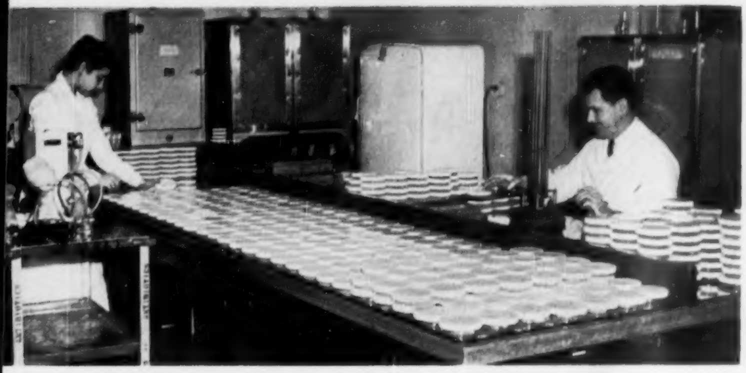
By George P. Larrick
Commissioner of Food and Drugs
Department of Health, Education, and Welfare

IN a large sense, the Federal Food, Drug, and Cosmetic Act in its entirety is a standard—a broad outline of what is required of those who handle commodities whose wholesomeness and integrity is essential to public welfare.

Before the first Federal food and drug law was enacted in 1906, honest manufacturers had to compete with those who debased their wares and brought public distrust of the whole industry. Merchants selling high-quality products had to pay for their own inspecting and testing to avoid adulterated and misbranded merchandise. Low income people, who couldn't afford this added cost, were at the mercy of a *caveat emptor* system. Today, in contrast, they can find in the supermarkets and the small neighborhood stores throughout the land products as pure as those found in the most expensive stores—with a large proportion of the packaged staple items identical.

The law sets forth certain basic requirements, including freedom from filth or decomposition, preparation and handling under sanitary conditions, packaging in safe containers, use only of certified coal-tar colors, and accurate declaration of the quantity of contents. It requires foods and cosmetics to be free from poisonous or deleterious substances, and drugs and vitamins to be as potent as their labels claim. For all products there is the "negative requirement" of freedom from false and misleading labeling. For foods and drugs there are certain positive labeling requirements to inform the purchaser as to composition of unstandardized articles, and, where necessary, safe and efficacious use.

The need for specific standards for individual foods and drugs was recognized when a Federal food and drug law was first considered by the Congress. Many of the bills intro-



Above, left — A 1956 laboratory technique—testing the identity of antibiotics on the recording infra-red spectrophotometer. Each antibiotic has its distinct pattern, just as each person's fingerprints differ from all others.

Above, right — Today the man with the badge also wears a white coat during inspection of a modern cosmetic plant.

In FDA's modern laboratories the potency of antibiotics is tested bacteriologically before certification.

Standards in

and Drug Control

duced in Congress before the 1906 law was enacted provided for the adoption of such standards.

Standards for foods posed a much more difficult problem than standards for drugs. The U.S. Pharmacopeia had already come into general use and its standards for drugs were accepted as reasonable and adequate. Little was known of food standards. A few states had legislatively adopted what amounted to standards of purity and strength for a few foods. The Association of Official Agricultural Chemists and the Association of Food and Drug Officials had published some proposed standards for a limited number of foods. The bill, which with some changes became the Food and Drugs Act of June 30, 1906, contained, when introduced, a grant of authority to the Secretary of Agriculture[1] to adopt standards of purity for foods. However, this was eliminated from the bill before it became law so that our first general Federal food and drug law did not provide standards for foods.

This bill provided that drugs sold under names recognized in the U.S. Pharmacopeia and National Formulary were to be deemed adulterated unless they complied with the standards set up by these official compendia. The requirement that drugs meet the standards prescribed by the Pharmacopeia and National Formulary was somewhat weakened, however, by a proviso that "no drug defined in the United States Pharmacopoeia or National Formulary shall be deemed to be adulterated under this provision if the standard of strength, quality, or purity shall be plainly stated upon the bottle, box, or other container thereof although the standard may differ from that determined by the test laid down in the United States Pharmacopoeia or National Formulary."

[1] The Federal food and drug laws, now enforced by the U. S. Department of health, Education, and Welfare, were enforced by the U. S. Department of Agriculture from January 1, 1907, until June 30, 1940.

Enforcement of the Food and Drugs Act of June 30, 1906, began January 1, 1907. The drug standards proved useful, but for many years the activities of inspectors and chemists working on drugs were directed mainly against what were known as "patent medicines." A great many of these were labeled so as to lead the purchaser to believe that they were remedies or cures for many serious conditions. Most of the ordinary household remedies of that time were listed either in the Pharmacopeia or National Formulary and samples of these were collected and tested according to the tests prescribed. Relatively few substantial variations were found.

In the early 1900's most of the potent drugs in use today were unknown. There was a large import traffic in crude drugs and considerable work was done at ports of entry in testing crude drugs offered for entry to determine if they complied with applicable standards. Many lots were detained.

As new drugs were developed, and different forms of old ones, they were included in the National Formulary or Pharmacopeia and made subject to standards. The drug industry, the medical profession, and the Federal regulatory officials were generally satisfied with the drug standards provided under the Act of 1906, and when the Federal Food, Drug, and Cosmetic Act was enacted in 1938 it retained the fundamental requirements of the 1906 Act with respect to standards for drugs but changed the proviso previously quoted to require a statement of how a product differed from the official standard. In addition, the 1938 Federal Food, Drug, and Cosmetic Act contains a special provision for controlling new drugs. This law was later amended to provide for predistribution testing and certifying of insulin, and several antibiotic drugs.

The standards for drugs provided by the U.S. Pharmacopeia and National Formulary are not formulated by the Government but by nongovernmental agencies. This has at times led to speculation as to the legality of such standards adopted after the passage of the Acts involved. A Wisconsin law which made existing and future standards of the U.S. Pharmacopeia standard under the Wisconsin law was attacked recently on the ground that authority to make laws could not be delegated to nongovernmental bodies. The Supreme Court of Wisconsin, however, held that the adoption of U. S. Pharmacopeia standards was not a delegation of authority to legislate.

The enforcement of the adulteration provisions of the 1906 Act with respect to foods quite often ran into difficulty due to lack of food standards. Many state officials enforcing state food laws similar to the Federal law and likewise without food standards had the same difficulty, and in 1913 the Association of Food and Drug Officials and the Association of Official Agricultural Chemists requested the Secretary of Agriculture to set up some method for adopting a form of food standards. The Secretary appointed a committee which included members from the Association of Food and Drug Officials, the Association of Official Agricultural Chemists, and the Bureau of Chemistry. The committee was instructed to recommend standards of purity for those foods about which sufficient data were available to justify such recommendations. This committee began functioning promptly. Its recommendations, which were based mainly on recommendations of food manufacturers, were published by the Secretary of Agriculture as suggested standards of purity for foods. The standards, though not mandatory, were widely used. Failure to comply with such a standard was not necessarily a violation of the Act of 1906 but usually noncompliance could be shown to result in the product being adulterated under one or more of the general provisions defining adulteration. It was generally recognized, however, that a label explanation of deviation from a standard was sufficient to correct those deviations which did not involve poisonous or deleterious ingredients.

Although the advisory standards were useful in many ways they left many loopholes. Since they had no legal status, the Government soon found that it had to introduce testimony in Federal court to prove that undeclared variations were not expected by consumers or sanctioned by good trade practice. Eventually, judge and juries brought in conflicting decisions on essentially the same facts, and manufacturers could not be certain of their obligations.

Congress in 1923 adopted a congressional standard for butter. Many states in their dairy or food laws adopted standards for various foods. In this way many states made the advisory standards of the Department of Agriculture legal state standards. During this period many states also adopted standards for ice cream.

The theory was quite widely held prior to 1938 that any foods not dangerous to health could not be rendered illegal by a standard. This theory received a test when certain state laws setting a minimum limit on the fat content of ice cream were carried to the U.S. Supreme Court on appeal. This court, however, upheld the validity of these laws and removed another road block in the way of compulsory legal standards.

All of the advisory standards issued by the Secretary of Agriculture were standards of purity or what we would now call identity standards. The need for quality standards became evident to canners of fruits and vegetables and, in 1930, the National Canners Association sponsored a bill to amend the Act of 1906 to give the Secretary of Agriculture authority to adopt standards of quality and fill of container for canned fruits and vegetables. The amendment was known as the McNary-Mapes amendment, and quality standards for the more important canned fruits and vegetables were soon adopted. These quality standards should not be confused with grade standards. The quality stand-

ards under the Act of 1906 were minimum quality standards and, if not met, the product was required to bear a label showing that it was of substandard quality.

On the whole the application of these standards proved effective and when bills providing for the adoption of a new food, drug, and cosmetic law were drafted prior to 1938 there was little opposition to a grant of authority to the Secretary of Agriculture to promulgate standards for foods.

The 1938 Federal Food, Drug, and Cosmetic Act as finally enacted prescribed a procedure for adopting standards for foods calling for adequate notice of intention, a public hearing, and finding of facts based on substantial evidence adduced at such hearing. The Secretary was then authorized to formulate reasonable standards which would promote honesty and fair dealing in the interest of consumers. The law provides for food standards of three kinds: identity, quality, and fill of container. Authority is also granted for setting special maturity standards and limits on frost damage in certain fruits and vegetables.

Standards were proposed by the Food and Drug Administration based on recommendations of its Food Standards Committee. The adoption of standards has progressed rather slowly but there are now identity standards for most of the important foods to which standard-making authority applies, and a few quality and fill-of-container standards.

IN the nature of things, the adoption of mandatory food standards means that a considerable number of products may need to be changed to conform. Such changes proved a somewhat painful experience to some food manufacturers. The first big court test of the legality of the new standards came when an attack was made on the standard of identity for enriched farina, which, like that for enriched flour, set specific fortification levels. The U.S. Supreme Court upheld the adoption of this standard. Several other standards were later subjected to court review but except in a few minor matters the standards were upheld.

The procedure originally prescribed was modified by Congress in an amendment to Section 401 adopted in 1954 known as the Hale Amendment. This procedure provides for publication of proposals by any interested party to adopt, amend, or repeal standards for foods, consideration of the comments received, and publication of an order acting on the proposals. Unless a person who would be adversely affected by such an order files objections and requests a public hearing the order becomes effective without a hearing. This procedure has so far worked well.

With a rapidly developing food technology, food standards must be revised from time to time. There is still much to be done in adopting needed identity standards and the field of quality and fill-of-container standards is even more extensive. The Food and Drug Administration has curtailed its activities in standards-making for the past few years because of other pressing needs for its personnel. It has likewise had to devote less enforcement time to economic violations, which has resulted in unfair competition to those who have complied with them voluntarily.

An upward trend in appropriations will permit more work on the adoption and enforcement of food standards and they should become more and more important in protecting the interests of consumers.

Gaillard Seminar

ON INDUSTRIAL STANDARDIZATION

New York, January, 1957

The next Gaillard Seminar on Industrial Standardization will be held January 21 through 25, 1957, in the Engineering Societies Building, New York City. There will be ten conferences, one every morning and afternoon, Monday through Friday. Devoted primarily to the organization of standardization in an individual company, the Gaillard Seminars, held twice a year since 1947, have been attended so far by 312 men from 174 organizations. Thirty-nine of these have sent delegates to two or more sessions. One company has been represented at eight seminars by a total of 15 men.

In addition to delegates from 150 companies, the Gaillard Seminars have been attended by representatives from trade associations; engineering societies; the American Standards Association and four foreign national standards bodies; the Army, Navy, and Air Force; the National Bureau of Standards; the Mellon Institute; the Armour Research Foundation; the Massachusetts Institute of Technology; the Universities of California and Illinois; and the Hydro-Electric Power Commission of Ontario.

For further details and registration, write to Dr John Gaillard at his new address: Box 273, Route 1, Briarcliff Manor, N. Y. Places for the seminar may be reserved in advance.

Miniature Screws

. . . a report on two new standards for threads and fasteners

STANDARDIZED screw threads seem no novelty since their interchangeability in most products has been common for many years. This happy state has been true, though, in a size range above the No. 0-80 (0.060-in.) machine-screw thread—not for anything smaller.

At one time, lack of interchangeability and apparent confusion below 0.060-in. diameter mattered little. Although the problems were many, they were so tiny and bothered so few people. Miniature screws were used principally in watches. The watch companies, each with its line of proprietary products, went their own ways, with neither compulsion nor reason influencing any attempts toward standardization.

But just as World War I emphasized the need for improved standardization of the larger thread sizes, World War II, through the impetus it gave to instrumentation and miniaturization, pointed up the rapidly increasing importance of the smaller screw threads and the dire need for their standardization.

In the United States, standardization of miniature threads has been under continuous study since 1944. Collaboration with the other principal inch-using countries of the world under the ABC program, and with the metric countries through the International Organization for Standardization (ISO), has now brought to fruition a miniature thread standard that will be common to all the industrial countries of the world.

A natural sequel to the development of the thread standard is the activity, also nearing completion, on a standard for miniature fastening screws.

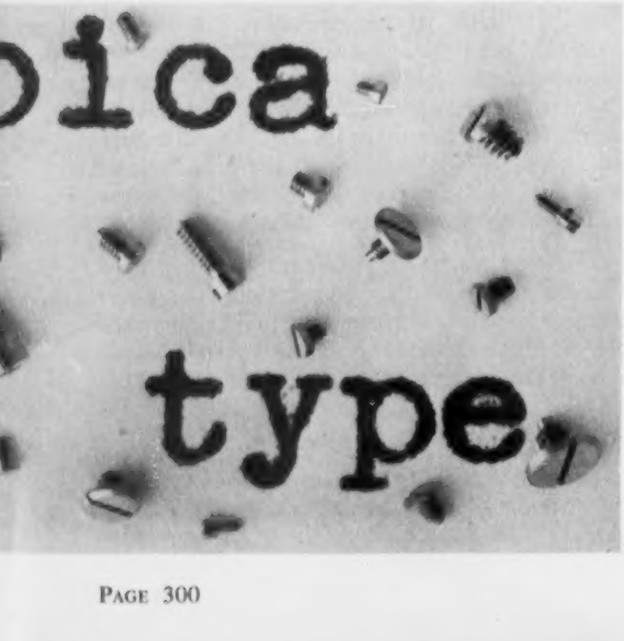
Some appreciation of the threads and fasteners with which these two standards are concerned can be derived from Figures 1-3.

The highlights of these two standards are presented in this article. Since both standards will soon be circulated for industry comment, this discussion may aid interpretation of the standards and possibly stimulate questions or suggestions. Such comment will be welcomed by the several ASA committees involved and may prove helpful before final approval of the standards.

Miniature Screw Threads

The proposed standard, to be known as Miniature Screw Threads, is intended for general-purpose fastening screws in watches, instruments, and miniature mechanisms. The series covers a diameter range from 0.30 to 1.40 mm (0.0118 to 0.0551-in.) and thus supplements the Unified and American thread series which begins at 0.060-inch. It is comprised of a total of 14 sizes which, together with their respective pitches, are those endorsed by the American-British-Canadian Conference as the basis for a unified standard among the inch-using countries, and coincide with the corresponding range of sizes recommended by ISO.

1



2

by E. W. Drescher
Superintendent of Product Appraisal, Hamilton Watch Company, Lancaster, Pa; chairman, subcommittee on instrument screw threads, B1.4

• Reprinted from *Machine Design*, August 23, 1956.

Additionally, it utilizes thread forms which are compatible in all significant respects with both the Unified and ISO basic thread profiles. Thus, this thread series establishes interchangeability with the corresponding sizes in both the ABC and the ISO standardization programs.

The 14 sizes are systematically distributed, providing a uniformly proportioned selection over the entire range. They are alternately separated into two categories. The sizes shown in bold-face type in accompanying tables are selections made in the interest of simplication and are those to which it is recommended that usage be confined wherever the circumstances of design permit. For more restrictive conditions the intermediate sizes shown in light-face type are available.

The diameter-pitch combinations have been determined to provide both maximum strength against stripping and optimum conditions for manufacture on an interchangeable basis.

Form of Thread: The theoretical profile on which the design forms of the threads covered by the standard are based is, except for one element, the Unified and American basic thread form as presented in American Standard Unified and American Screw Threads—ASA B1.1-1949. An exception is thread height, for which a basic value of $0.52p$ is used

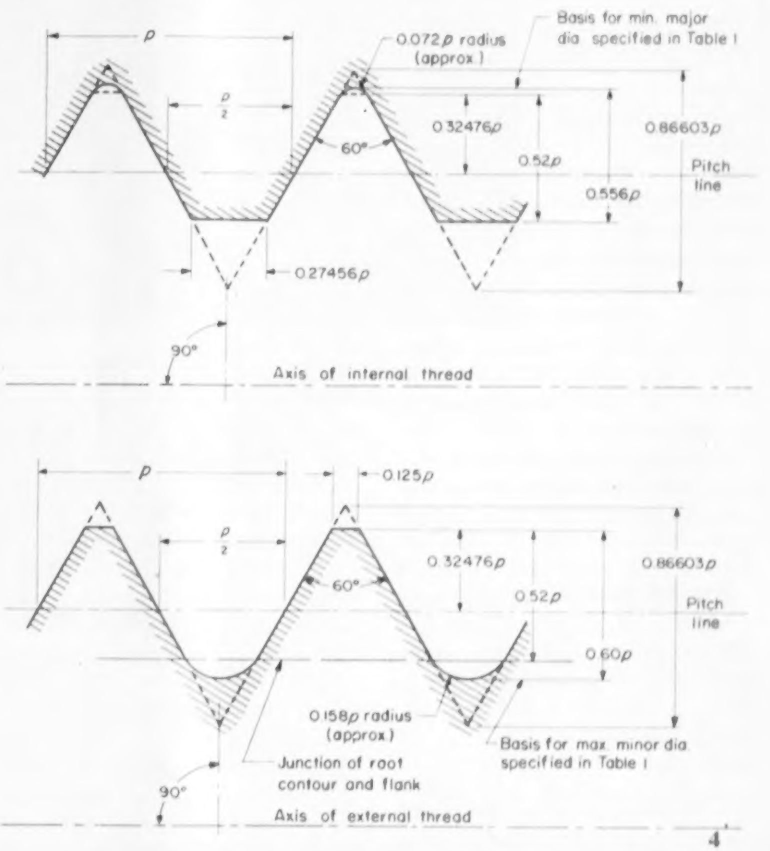


Figure 4—*Design (maximum-material) thread forms of miniature screw threads.*

3

4

Figure 1 — *Miniature screws in relation to type size of commercial typewriter. On these special watch screws, major thread diameters range from* 0.30 *to* 0.90 *mm* (0.118 *to* 0.0354 *in.*).

Figure 2 — *Stainless-steel miniature screws compared with a pin and a sewing needle.*

Figure 3 — No. 0-80 *machine screw compared with miniature fillister-head screws of* 0.60 *mm* (0.0236 *in.*) *major thread diameter.*

> **Comments? Questions?**
>
> Standards serve their intended purposes only if needed — and used without undue reservation. Do you have comments — pro or con — or questions on these thread and screw standards? They will be welcomed by the ASA subcommittees.
>
> Send to American Standards Association for forwarding.

instead of $0.54127p$ ($5\ H/8$). Selection of this value is based on the simplification which it affords throughout the calculations for the miniature-thread standard. This modification will not affect interchangeability with product made to any other standards retaining $0.54127p$, since the resulting difference is negligible and completely offset by practical considerations in tapping.

The design forms (maximum material condition) of the external and internal threads are shown in Figure 4.

Nominal Sizes: The thread sizes comprising the miniature series and their respective pitches are shown in the left-hand columns of Table 1. Only one class of thread is established with zero allowance on all diameters.

Tolerances: In Table 1 tolerances are shown for all miniature sizes; Figure 5 shows the effect of tolerances at large scale for one of the standard sizes. Tolerances governing limits of size are based on functions of the pitch only and apply to lengths of engagement from 2/3 to 1½ times the nominal diameter.

Coated Threads: It is not within the scope of the standard to make recommendations for thicknesses of, or to specify limits for, coatings. However, it is obvious that in these small sizes any coatings applied must be kept thin because of the smallness of the threads. Generally, the coatings employed in practice are confined to those of the electroplated or oxide types and are limited to a flash thickness. For applications where these coatings are inadequate, the product is usually made of a corrosion-resistant material, thereby avoiding the problems attendant to providing for heavier coatings. However, where coatings of a measurable thickness are required, it is essential that they be included within the maximum material limits since no allowance is provided between these limits of the external and internal thread. In other words, the maximum material limits given in the standard apply to both uncoated and coated threads.

Designation: It is recommended that miniature screw threads be designated on engineering drawings, in specifications, and on tools and gages (when space permits) by their nominal diameters in hundredths of a millimeter followed by the symbol "NM." To these designations may be affixed, in parentheses, the inch equivalent of the basic major diameter, but this addition is optional. Thus, for example, the thread size identified by the designation 80 NM may also be designated 80 NM (0.0315).

Acceptability: The formulation of recommended methods for determining acceptability of these threads is anticipated after the accumula-

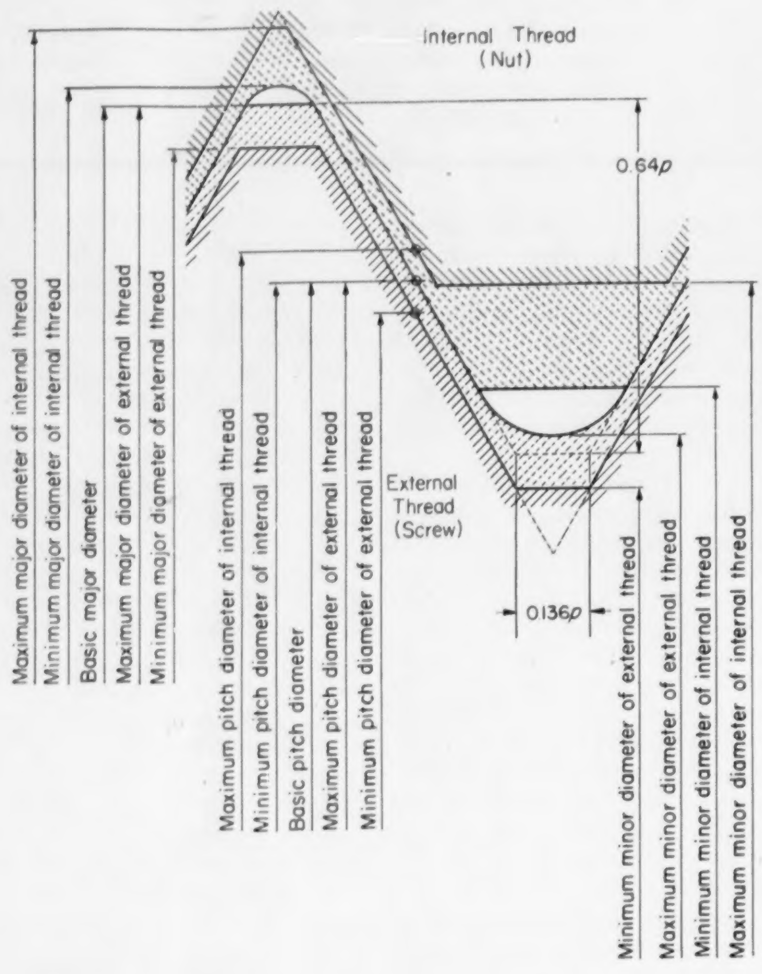


Figure 5—*Limits of size for 120 NM thread.*

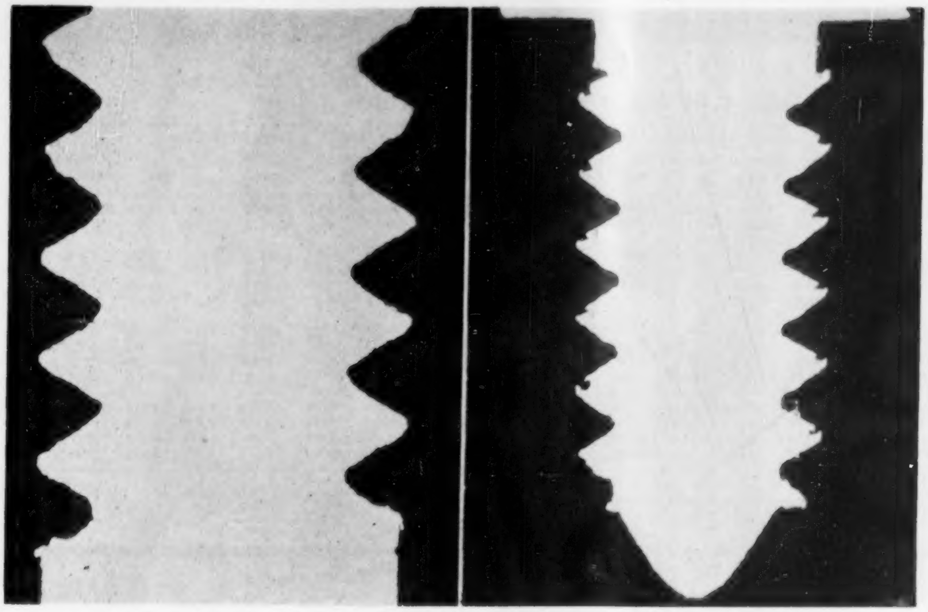


FIGURE 6 — *Sections of miniature screw threads: die-cut, stainless steel, 339 threads per inch; spun thread, 282 threads per inch.*

tion of further experience with the thread standard. Until such time, agreements must be reached between purchaser and vendor regarding the basis for determining acceptance, since practices are various and differ considerably, particularly for external threads. Where a free choice is possible, the following procedures, which are being successfully used by some producers, are suggested. For external threads, the utilization of optical projection instead of ring gaging overcomes many of the uncertainties stemming from the difficulties of establishing the accuracy of, and duplicating, thread ring gages in these small sizes.

The major diameter of the external thread is inspected by either contact gaging or optical projection. All other dimensions, such as pitch diameter, lead, thread form and minor diameter, are inspected by optical projection methods with a magnification of 100X recommended.

The minor diameter of the internal thread is gaged with "GO" and "NOT GO" plain cylindrical plug gages. All other elements are checked only for assembleability limits by means of a "GO" thread plug gage. For the minimum material limit of the internal thread, accuracy and performance of the tap are relied upon. This implies that the major and pitch diameters of the tap do not exceed the maximum internal thread limits for these elements and disregards overcutting, which is rarely incurred because of the flexibility of these small taps and the manner in which they are generally fluted.

Hole Sizes for Tapping: Table 2

Figure 7—*Working taps ranging from 30 to 90 NM; fluted dies for cutting miniature threads.*

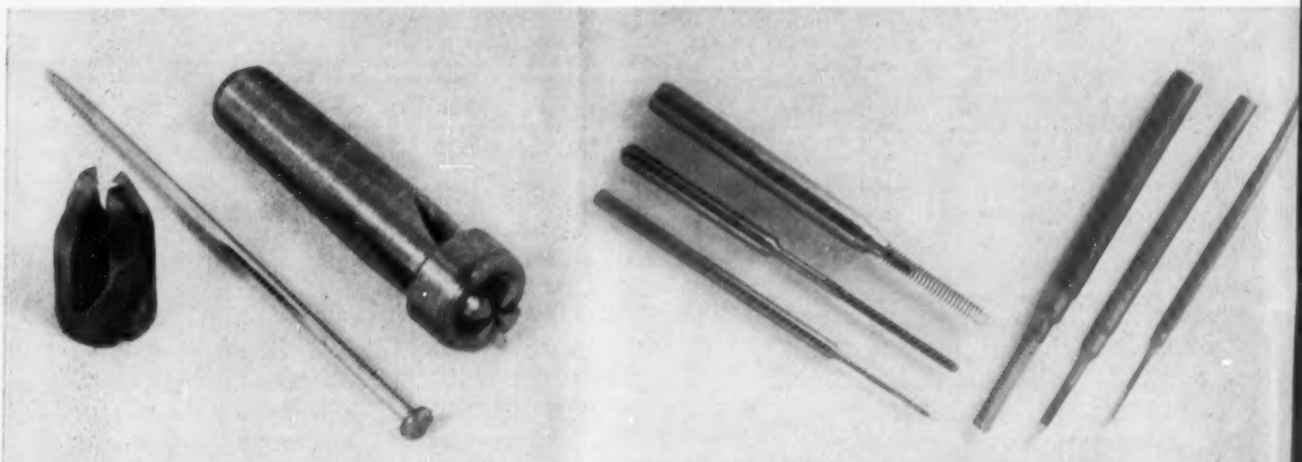


Table 1—Limits of Size and Tolerances

Size Designation	Pitch (mm)	Threads per Inch	External Threads: Major Diam. Max.	Major Diam. Min.	Major Diam. Tol.	Pitch Diameter Max.	Pitch Diameter Min.	Pitch Diameter Tol.	Minor Diam. Max.	Minor Diam. Min.	Internal Threads: Minor Diam. Min.	Minor Diam. Max.	Minor Diam. Tol.	Pitch Diam. Min.	Pitch Diam. Max.	Pitch Diam. Tol.	Major Diam. Min.	Major Diam. Max.
30 NM	0.080	318	0.0118	0.0112	0.0006	0.0098	0.0092	0.0006	0.0080	0.0072	0.0085	0.0100	0.0015	0.0098	0.0104	0.0006	0.0120	0.0129
35 NM	.090	282	.0138	.0131	.0007	.0115	.0109	.0006	.0095	.0087	.0101	.0117	.0016	.0115	.0121	.0006	.0140	.0149
40 NM	.100	254	.0157	.0150	.0007	.0132	.0126	.0006	.0110	.0101	.0117	.0134	.0017	.0132	.0138	.0006	.0160	.0170
45 NM	.100	254	.0177	.0170	.0007	.0152	.0145	.0007	.0130	.0120	.0136	.0154	.0018	.0152	.0158	.0006	.0180	.0190
50 NM	.125	203	.0197	.0189	.0008	.0165	.0158	.0007	.0138	.0127	.0146	.0166	.0020	.0165	.0172	.0007	.0200	.0212
55 NM	.125	203	.0217	.0208	.0009	.0185	.0178	.0007	.0157	.0146	.0165	.0186	.0021	.0185	.0192	.0007	.0220	.0231
60 NM	.150	169	.0236	.0227	.0009	.0198	.0190	.0008	.0165	.0153	.0175	.0198	.0023	.0198	.0206	.0008	.0240	.0254
70 NM	.175	145	.0276	.0265	.0011	.0231	.0222	.0009	.0193	.0179	.0204	.0231	.0027	.0231	.0239	.0008	.0281	.0295
80 NM	.200	127	.0315	.0303	.0012	.0264	.0254	.0010	.0220	.0205	.0233	.0263	.0030	.0264	.0273	.0009	.0321	.0337
90 NM	.225	113	.0354	.0341	.0013	.0297	.0287	.0010	.0248	.0231	.0262	.0295	.0033	.0297	.0307	.0010	.0361	.0379
100 NM	.250	102	.0394	.0380	.0014	.0330	.0319	.0011	.0276	.0257	.0291	.0327	.0036	.0339	.0341	.0011	.0401	.0420
110 NM	.250	102	.0433	.0419	.0014	.0369	.0358	.0011	.0315	.0296	.0331	.0367	.0036	.0369	.0380	.0011	.0440	.0460
120 NM	.250	102	.0472	.0458	.0014	.0409	.0398	.0011	.0354	.0335	.0370	.0406	.0036	.0409	.0420	.0011	.0480	.0499
140 NM	.300	85	.0551	.0535	.0016	.0474	.0462	.0012	.0409	.0387	.0428	.0471	.0043	.0474	.0487	.0013	.0560	.0583

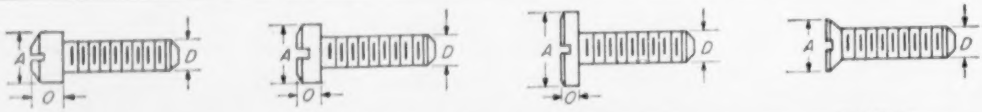
All dimensions, except pitch, are inches.

Sizes shown in bold-face type are preferred. It is recommended that selections be confined to these sizes insofar as possible.

Table 2—Hole-Size Limits Before Tapping

Designation	Pitch (mm)	Threads per Inch	Minor Diameter Limits (in.) Min.	Minor Diameter Limits Max.	Percentage of Basic Thread Height Max.	Percentage of Basic Thread Height Min.	Suggested Hole Size (in.) Vs. Length of Engagement: To and Including 2/3 D Min.	To and Including 2/3 D Max.	Above 2/3 D to 1½ D Min.	Above 2/3 D to 1½ D Max.	Above 1½ D to 3 D Min.	Above 1½ D to 3 D Max.
30 NM	0.080	318	0.0085	0.0100	100	54.8	0.0089	0.0095	0.0093	0.0100	0.0096	0.0104
35 NM	.090	282	.0101	.0117	100	56.4	.0105	.0111	.0109	.0117	.0113	.0121
40 NM	.100	254	.0117	.0134	100	57.7	.0121	.0127	.0125	.0134	.0130	.0138
45 NM	.100	254	.0136	.0154	100	57.7	.0141	.0147	.0145	.0154	.0149	.0158
50 NM	.125	203	.0146	.0166	100	60.0	.0150	.0158	.0156	.0166	.0161	.0171
55 NM	.125	203	.0165	.0186	100	60.0	.0170	.0178	.0176	.0186	.0181	.0191
60 NM	.150	169	.0175	.0198	100	61.5	.0181	.0190	.0187	.0198	.0193	.0204
70 NM	.175	145	.0204	.0231	100	62.6	.0211	.0221	.0217	.0231	.0224	.0237
80 NM	.200	127	.0233	.0263	100	63.5	.0240	.0252	.0248	.0263	.0256	.0270
90 NM	.225	113	.0262	.0295	100	64.1	.0270	.0283	.0279	.0295	.0287	.0304
100 NM	.250	102	.0291	.0327	100	64.6	.0300	.0314	.0309	.0327	.0319	.0337
110 NM	.250	102	.0331	.0367	100	64.6	.0340	.0354	.0349	.0367	.0358	.0376
120 NM	.250	102	.0370	.0406	100	64.6	.0379	.0393	.0388	.0406	.0397	.0415
140 NM	.300	85	.0428	.0471	100	65.4	.0439	.0455	.0450	.0471	.0460	.0481

Table 3—Head Details of Miniature Screws



Size Designation	Basic Maj. Diam. of Thd.	Fillister Head: Head Diam., A Max.	Head Diam., A Min.	Head Height, O Max.	Head Height, O Min.	Pan Head: Head Diam., A Max.	Head Diam., A Min.	Head Height, O Max.	Head Height, O Min.	Binding Head: Head Diam., A Max.	Head Diam., A Min.	Head Height, O Max.	Head Height, O Min.	Flat Head: Head Diam., A Max.	Head Diam., A Min.
30 NM	0.0118	0.021	0.019	0.012	0.010	0.025	0.023	0.010	0.008	0.033	0.031	0.008	0.006	0.023	0.021
35 NM	.0138	.023	.021	.014	.012	.029	.027	.011	.009	.037	.035	.009	.007	.025	.023
40 NM	.0157	.025	.023	.016	.013	.033	.031	.012	.009	.041	.039	.010	.007	.029	.027
45 NM	.0177	.029	.027	.018	.015	.037	.035	.014	.011	.045	.043	.011	.008	.033	.031
50 NM	.0197	.033	.031	.020	.017	.041	.039	.016	.013	.051	.049	.012	.009	.037	.035
55 NM	.0217	.037	.035	.022	.019	.045	.043	.018	.015	.057	.053	.014	.011	.041	.039
60 NM	.0236	.041	.039	.025	.021	.051	.049	.020	.016	.062	.058	.016	.012	.045	.043
70 NM	.0276	.045	.043	.028	.024	.057	.053	.022	.018	.072	.068	.018	.014	.051	.049
80 NM	.0315	.051	.049	.032	.028	.062	.058	.025	.021	.082	.078	.020	.016	.057	.053
90 NM	.0354	.057	.053	.036	.032	.072	.068	.028	.024	.092	.088	.022	.018	.062	.058
100 NM	.0394	.062	.058	.040	.035	.082	.078	.032	.027	.102	.098	.025	.020	.072	.068
110 NM	.0433	.072	.068	.045	.040	.092	.088	.036	.031	.115	.105	.028	.023	.082	.078
120 NM	.0472	.082	.078	.050	.045	.102	.098	.040	.035	.125	.115	.032	.027	.092	.088
140 NM	.0551	.092	.088	.055	.050	.115	.105	.045	.040	.145	.135	.036	.031	.102	.098

All dimensions are inches.

Table 4—Screw-Body Lengths

Nominal and Max.	Min.
0.012	0.009
.016	.013
.020	.016
.025	.021
.032	.027
.040	.035
.050	.044
.060	.054
.080	.072
.100	.092
0.120	0.110
.160	.150
.200	.188
.250	.238
.320	.304
.400	.384
.500	.480
.600	.580

Minimum standard length of screw (*L*) for each size shall be the nominal length just above

1. One times the nominal thread diameter for screws having a flat bearing-surface type of head.
2. One and one-half times the nominal thread diameter for screws having a conical bearing-surface type of head.

Maximum standard length for each size, regardless of head type, shall be the nominal length just above ten times the nominal thread diameter.

Threaded length shall extend to within two threads of the bearing surface of the head, or closer if practicable, on all screws having a length *L*, four times the nominal diameter or less. Screws of greater length shall possess complete threads for a minimum of four diameters. On screws not threaded to the head the diameter of the unthreaded body shall not be less than the minimum pitch diameter of the thread nor more than the maximum major diameter of the thread.

All dimensions are inches.

Table 5—Head-Diameter Series

Nominal	Max.	Min.	Nominal	Max.	Min.
0.020	0.021	0.019	0.060	0.062	0.058
.022	.023	.021	.070	.072	.068
.024	.025	.023	.080	.082	.078
.028	.029	.027	.090	.092	.088
.032	.033	.031	.100	.102	.098
.036	.037	.035	.110	.115	.105
.040	.041	.039	.120	.125	.115
.044	.045	.043	.140	.145	.135
.050	.051	.049	.160	.165	.155
.055	.057	.053	.180	.185	.175

All dimensions are inches.

lists the hole-size limits recommended for tapping. These limits are derived from the internal thread minor diameter limits given in Table 1 and are disposed so as to provide the optimum conditions for tapping. The maximum limits are based on providing a functionally adequate fastening for the most common applications, where the material of the externally threaded member is of a strength essentially equal to or greater than that of its mating part. In applications where, because of considerations other than the fastening, the screw is made of an appreciably weaker material, the use of smaller hole sizes is usually necessary to extend thread engagement to a greater depth on the external thread. However, hole sizes down to the minimum limit of the minor diameters must be avoided to allow for the spin-up developed as the result of the negative rake with which these small taps are usually ground.

Miniature Fastening Screws

Details of the proposed new standard on screws are presented in abbreviated form in Tables 3-5. All head diameters given in Table 3 have been selected from the head-diameter series of Table 5. It is suggested that the series in Table 5 should also govern the design of any special screws.

Production Methods: Miniature screws are invariably formed by machining rather than by cold-upsetting methods. Rod stock is fed through guide-bushing type automatic machines which can deliver finished screws at the rate of one every 5 seconds.

Method of threading varies to some extent. For highest quality threads and where tough materials are encountered, adjustable cutting dies are employed. Fig. 6 shows a cross-section of a miniature thread die-cut of stainless steel.

Where a lower quality is permissible and the material is sufficiently ductile, the threads are spun up with forcing plates which are simply hardened nuts. Although this method is similar to thread rolling, the thread differs. The fold produced by the displaced material usually occurs on the pressure flank of the thread, Figure 6.

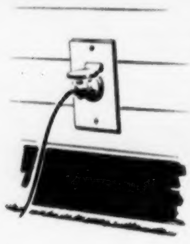
Some idea of size and detail of taps and dies for miniature threads is provided by Figure 7.

The basic tool in the production of miniature screws and tapped products is the master tap. It is chased on high-precision semiautomatic machines. Besides an abnormally severe problem in the holding of tolerances, difficulties arise from deformations due to tool pressure and breakdown of the tool point. The latter problem can be particularly troublesome in the smallest pitches where the minimum root flat is only 0.0004-in. on the product — and less on the master tap.

To date, these small roots have prevented the use of grinding methods for producing master taps and thread plug gages. The machining methods have proved successful only with careful selection of tool steels and special bright-hardening techniques to preserve the machined accuracy.

Production of miniature threaded products obviously is dependent upon high-precision delicate gages, measuring machines, and projectors. The order of accuracy required is suggested by this one detail: For pitch diameter measurement of the smallest thread plug gages, wires only 0.0022-in. diameter (human hair, 0.003 or 0.004-in.) are required.

National Electrical Code Recognizes Changing Practice



Arrow-Hart & Hegeman Co.

by Merwin Brandon

Home owners who want to use electric appliances or hand tools on their open porches, patios, in breezeways, garages, or other places where they may be standing on ground, can do so safely by installing grounding-type receptacles. This is recognized and now is included as one of the requirements in the new edition of the National Electrical Code, just issued. All receptacles used for this purpose must be of the grounding type described in American Standard C73a-1953. As a matter of fact, development of the 1953 American Standard for a grounding receptacle has made it possible for the first time to include the requirement in the Code with the likelihood that it will accomplish the desired purpose.

This provision is only one of the changes and additions agreed upon as necessary to bring the requirements of the 1956 Code into line with existing practice. In the main, however, the Code consists of time-tested safety requirements that are used by most communities in the United States for protecting persons and buildings from hazards due to the use of electricity.

The Code was originally drawn in 1897 and has been brought up to date regularly since that time. It contains basic minimum provisions considered necessary for safety, and applies to electric conductors and equipment installed in or on buildings and also to conductors that connect the installations to a supply of electricity. Thus it provides for adequate wiring, outlines wiring methods and materials, gives minimum requirements for electric equipment in general use, for communications systems, and for special equipment and special occupancies.

The Code is prepared under the sponsorship of the National Fire Protection Association and submitted to the American Standards Association for approval as American Standard. The new edition is identified as American Standard C1-1956.

Some of the changes in the 1956 edition will be of wider general interest than others.

New current conductivity tables for aluminum conductors have been added, in view of the increasing use of these conductors for building wires. These current-carrying capacity tables are very similar to the copper wire tables except that, due to the lower conductivity of aluminum, the aluminum sizes have to be about two gages larger for the same current-carrying capacity.

An important clarification has been made in the requirements for transformer vaults (Section 4542) so that any type of construction having the proper mechanical strength and fire resistance may be used in addition to the specific construction previously recommended in the Code.

Recognition is given in Section 2203 to the fact that air-cooling and electric-heating loads in a given area are not likely to be applied simultaneously, so only the larger one need be used in calculating feeder sizes.

Attention is called to the fact that in a large installation of electric discharge lamp ballasts (fluorescent lighting) a third harmonic may be present and will require a neutral conductor as large as the ungrounded conductors (paragraph b, Section 2203).

Fuses in multiple are recognized for motor loads where the capacity of the largest approved cartridge type fuse is exceeded (Section 2411).

Unfused taps are recognized in ten-foot lengths instead of five-foot lengths in recognition of the increased size of equipment (paragraph c, Section 2434).

A 90-degree rubber insulation is recognized for the first time (Section 3102).

Armored cable of the varnished cloth type (ACV)is recognized for the first time in commercial applications (Section 3342). It had been restricted previously to industrial applications.

Underfloor raceways which were previously restricted to conductors no longer than 1/0 may now use conductors as large as 500 circular mils where the raceways are large enough for the increased size (Section 3544).

Mr Brandon, vice-president of Underwriters' Laboratories, New York, is chairman of the Electrical Section, National Fire Protection Association, which is in charge of work on the National Electrical Code.

A new type of raceway, cellular concrete floor raceway, is recognized for the first time (Article 358). It is very similar to the cast-in-place concrete raceway that was used at one time to some extent in New York City, except that this new material is formed in slabs prior to installation in the building and the smooth hollow spaces serve as the raceways for the wiring.

Specific mention is included of the new type of a-c snap switch, which is tested for tungsten filament lamp loads and motor loads (paragraph g, Section 3814).

Specific requirements relating to the installation of unit type air-conditioning equipment have been incorporated (Sections 4291 and 4293). These requirements were previously covered in Interim Amendment No. 101, which now becomes an official part of the Code.

This is not by any means a complete discussion of all the changes and revisions that have been incorporated in the 1956 National Electrical Code, but is an attempt to point out the most important changes having the broadest application.

Copies of the National Electrical Code (NFPA 70), American Standard C1-1956, are available from ASA as well as NFPA at $1.00 each.

IN MEMORIAM

SIDNEY J. WILLIAMS, 70, pioneer in work on nationwide standards for industrial and highway safety, died August 5, as the result of a cerebral hemorrhage complicated by pneumonia.

Mr Williams was one of the group who met at the National Bureau of Standards in 1919 to consider how work on safety standards could best be carried out to provide coordinated safety recommendations on a nationwide basis. He represented the National Safety Council at this meeting. When it was decided that coordinated safety standards should be developed through the procedures of the American Engineering Standards Committee (now the American Standards Association), it was logical that he should become a member of the National Safety Code Committee, set up to implement that decision. The Safety Code Correlating Committee (now the Safety Standards Board) was organized by AESC in 1922 to supervise and direct this nationwide safety program and Mr Williams became its first chairman. In addition, he served as the National Safety Council's representative on a number of the sectional committees organized to develop specific standards.

Mr Williams was author of the Manual of Industrial Safety and was a contributor over many years to books, encyclopedias, and periodicals.

As work on highway safety increased in importance, Mr Williams took an active part and became recognized as a pioneer leader in traffic safety. He had joined the National Safety Council staff as chief engineer in 1918. In 1924 he was made Director of the Public Safety Division. He became General Manager in 1944, and Assistant to the President in 1945. He actively directed the National Safety Council's traffic safety work from its inception in 1924 until his semi-retirement in 1950.

During this same period, Mr Williams served as a member of ASA's Highway Traffic Standards Board (1938 to 1954) and chairman (1948 to 1953). He was a member of a number of sectional committees on traffic safety and chairman of Sectional Committee D7 on Inspection Requirements for Motor Vehicles.

Mr Williams took an active part in the National Conference on Street and Highway Safety, the President's Highway Safety Conference, and other conferences, joint committees, and training courses on traffic safety.

In 1947, Mr Williams was chairman of the Safety and Industrial Health Advisory Board, U. S. Atomic Energy Commission, and he continued as safety consultant to the AEC. He was chairman of the National Committee on Uniform Traffic Laws and Ordinances and was a leader in working for the enactment of uniform traffic laws throughout the nation. He was a charter member of the Institute of Traffic Engineers.

Mr Williams received the CIT (Commercial Investment Trust) Safety Foundation grand award in 1938 for the greatest contribution to public safety; the Beecroft Memorial Lecturer award in 1950; and the Arthur Williams Memorial Award in 1954.

Of Mr Williams' role in the development of American Safety Standards, Cyril Ainsworth, Technical Director of the American Standards Association, says: "If it had not been for his vigorous leadership, this program would not be as far advanced as it is today. No one can question his role as dean of the traffic safety movement in this country, but in many ways his role in the field of industrial safety was of equal significance, because it came at a period when industrial safety was being born and nurtured into full growth. One would be hard put to find another person who has made such an outstanding contribution to the accident prevention movement."

Start Industry's Nuclear Standards

INDUSTRY'S program to develop standards for peacetime applications of nuclear energy was started at a meeting September 18 when the Nuclear Standards Board of the American Standards Association was organized. Morehead Patterson, chairman of the Board and President of the American Machine and Foundry Company, New York, was elected chairman.

The new Board authorized six projects for development of standards under ASA's sectional committee method. It also selected organizations which are being invited to serve as sponsors, and recommended in general a scope for each project which will be reviewed by the sponsors before final approval. These are:

1. General and Administrative Standards for Nuclear Energy. *Sponsor*: Atomic Industrial Forum. *Scope*: Nomenclature; color codes; symbols; qualifications of professionals; accountability; records and reporting procedures.

2. Nuclear Instruments. *Sponsors*: Radio - Electronic - Television Manufacturers Association; National Bureau of Standards. *Scope*: Standards, specifications and methods of testing for instruments used in the nuclear field including instruments for personnel protection, reactor control, industrial processes, analysis and laboratory work, radiation calibration equipment and components therefor.

3. Electrical Requirements for Reactors and Nuclear Power Systems and Generation and Application of Nuclear Radiation. *Sponsors*: American Institute of Electrical Engineers; Electric Light and Power Group; National Electrical Manufacturers Association. *Scope*: Standards, specifications, and methods of testing for nuclear power systems and in the generation and application of nuclear radiation.

4. Chemical Engineering in the Nuclear Field. *Sponsor*: American Institute of Chemical Engineers. *Scope*: Standards, specifications, and methods of testing in the field of chemical engineering in the nuclear field including fuel processing, separation and reprocessing and purification of materials, treatment of foods, production of tagged pharmaceuticals, separation of radio-isotopes, handling and treatment of radioactive gases, liquids and solids, chemical resistant coatings, cleaning facilities, decontamination of equipment.

5. Reactor Hazards. *Sponsors*: American Nuclear Society; American Society of Mechanical Engineers. *Scope*: Codes and standards concerned with the hazards involved in the design, location, construction, and operation of nuclear reactors and of potential critical assemblies.

A sixth project was authorized after discussion concerning its possible relation to the work of the Sectional Committee on Safety Code for the Industrial Use of X-rays and Radiation, Z54. This is a project on Radiation Protection for Personnel. The Atomic Industrial Forum and the National Safety Council are being invited to serve as co-sponsors. Before any decision is made concerning the scope of this committee's work the sponsors will confer with the sponsor of Sectional Committee Z54 to determine the wording.

The first work on which the Nuclear Standards Board will be asked to take action is a Glossary of Terms in Nuclear Science and Technology which has been submitted to ASA for approval. The Glossary was developed under the auspices of the National Research Council and published in 1953 as a Proposed American Standard by the American Society of Mechanical Engineers. Now the Nuclear Standards Board is being asked to review the work and make recommendations to ASA's Standards Council on its approval as the first American Standard in the field of nuclear energy.

The Board voted to invite a number of organizations to name representatives in addition to the 25 original members. Those being invited are the American Federation of Labor—Congress of Industrial Organizations; American Chemical Society; American Nuclear Society; American Society of Civil Engineers; Manufacturers Standardization Society of the Valve and Fittings Industry; Scientific Apparatus Manufacturers Association; and the Conference of State and Provincial Health Authorities.

Organizations represented on the Board are:

Aircraft Industries Association of America, Inc; American Industrial Hygiene Association; American Institute of Chemical Engineers; American Institute of Electrical Engineers; American Public Health Association; American Society of Mechanical Engineers; American Society of Safety Engineers; American Society for Testing Materials; Association of Casualty and Surety Companies; Atomic Industrial Forum, Inc; Bureau of Explosives; Electric Light and Power Group (Association of Edison Illuminating Companies and Edison Electric Institute); Institute of Radio Engineers; International Association of Governmental Labor Officials; Manufacturing Chemists Association, Inc; National Association of Mutual Casualty Companies; National Electrical Manufacturers Association; National Safety Council; Radio-Electronics-Television Manufacturers Association; the Society of Automotive Engineers; U. S. Department of Defense; U. S. Department of Health, Education and Welfare; U. S. Department of Labor; U. S. Department of Commerce—National Bureau of Standards; and the U. S. Atomic Energy Commission.

NEWS BRIEFS.....

• The Greek Standards Committee is now issuing a monthly publication. The June 1956 number, the first in the new volume, contains a discussion of Greek standardization and its reorganization since the war; the way in which the committee is cooperating with the Technical Chamber of Greece, the Greek Productivity Center, the Athen's Chamber of Commerce and Industry, and the Federation of Greek Industry; work being done on Greek standards; and a number of specific proposals on building materials. Copies of the bulletin, in the Greek language, are now in the Library of the American Standards Association.

• Dr Richard K. Cook, Chief of the Sound Section of the National Bureau of Standards, has been elected president of the Acoustical Society of America. Dr Cook is an active member of Sectional Committee Z24, Acoustics, Vibration, and Mechanical Shock and of the Acoustical Standards Board, as a representative of the Bureau. He was recently granted a year's leave of absence from the Bureau to conduct research at the Bell Telephone Laboratories. In addition to his work with ASA he represents the National Bureau of Standards on committees of the American Society for Testing Materials, the American Medical Association, and on a number of defense advisory committees.

The Acoustical Society of America serves as sponsor for Sectional Committee Z24.

• As of April 1, 1956, the Armed Services Electro-Standards Agency (ASESA), Fort Monmouth, New Jersey, has established an engineering liaison at the Electronics Supply Office (ESO), Department of the Navy, Great Lakes, Illinois. Edmund P. Koenig was assigned to establish and operate the new office, which is in addition to the liaison office located at the Army Signal Supply Agency (TASSA), Philadelphia, Pennsylvania. James L. Harper is now the ASESA Liaison Engineer in Philadelphia.

Mr Koenig advises that during his assignment from 1945 to March 1956 as ASESA Liaison Engineer in Philadelphia, the success of the mission was due in a large measure to the cooperation of all the people who participated in furthering the standardization program. The experiences gained through these contacts will be of great value in successfully fulfilling his new assignment as ASESA Liaison Engineer at the Electronics Supply Office, he says.

It is expected that the ASESA Engineering Liaison Office in the Chicago vicinity will make available to industry and the military in this geographic area the same services as are available in the Philadelphia area.

The address of the new liaison office is: Edmund P. Koenig, ASESA Liaison (Code 27), Electronics Supply Office, Great Lakes, Illinois, Telephone: DElta 6-3500, Extension 8338.

• A report on the results of international meetings on textiles will be made to the press and to the groups concerned at a meeting October 18, 2:00 P.M., Hotel Warwick, New York.

• The United States is now participating in the international project on Refractories, ISO Technical Commitee 33. The American group for this work is the American Society for Testing Materials Committee C-8. The American Standards Association is the USA member of the International Organization for Standardization.

Richard J. Blum

• Richard J. Blum has been elected to ASA's Board of Directors on nomination of the National Retail Dry Goods Association. He is a director of Gimbel Brothers, Inc, vice-president of Saks & Company, and executive head of Saks-34th Street, New York. He is also a vice-president, director, and member of the Executive Committee of the National Retail Dry Goods Association and a Director and former President of the Retail Dry Goods Association of New York.

In 1950 Mr Blum was made an officer of the Order of Carlos Manuel de Cespedes by the President of the Republic of Cuba.

On ASA's Board of Directors, he will complete the unexpired term of I. D. Wolf, serving until the end of 1957.

• New York's Governor Averell Harriman has named Cyril Ainsworth, Technical Director of the American Standards Association, as a member of the Governor's Industrial Safety Advisory Committee. Brigadier General David Sarnoff, chairman of the Board, Radio Corporation of America, is chairman.

At the luncheon session of the Perkin Centennial's International Day—Crawford Greenewalt; Mrs Wallace H. Carothers; Clifford Paine; Sir Robert Robinson.

• Ten countries were represented at International Day, the opening of the Perkin Centennial, September 10-16. The meeting honored Sir William Henry Perkin, creator of "mauve," the first synthetic dye.

Sir Robert Robinson, Nobel Prize winner for chemistry, professor emeritus of Oxford University, and a director of the Shell Chemical Company, Ltd, delivered the principal address of International Day at the luncheon session. He was introduced by Crawford H. Greenewalt, president of E. I. duPont de Nemours and Company.

Posthumously honoring Dr Wallace H. Carothers, pioneer in the research that led to the discovery of nylon, the Perkin Medal of the British Society of Dyers and Colourists was presented to Mrs Carothers, widow of the scientist. Clifford Paine, president of the British Society, presented the medal at the International Day luncheon.

Colorfastness of textiles was the theme of the morning meeting. Papers citing new developments in colorfastness testing were presented by distinguished spokesmen from the United Kingdom, France, Germany, Switzerland, and the United States. M. L. Staples of the Ontario Research Foundation, Toronto, Canada, traced the developments over the last century in an introductory speech. This session was sponsored by the American Society for Testing Materials and the American Association of Textile Chemists and Colorists.

Theme of the afternoon session was Color—the Catalyst of Commerce. The role of color today in advertising, automobiles, consumer products, retailing, as well as textiles, was discussed.

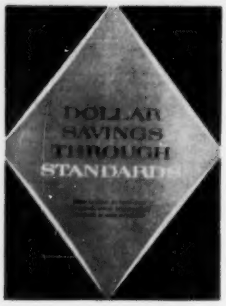
Co-sponsors of International Day were the American Standards Association and the International Organization for Standardization, which joined with 26 technical, chemical, and scientific societies in the week-long tribute to Perkin.

• The Executive Committee on Research of the American Association of Textile Chemists and Colorists has objected to the use by any organization of its recommended AATCC test procedures in any form but that officially published by AATCC as the proper form.

In a resolution, ECR states:

"The Executive Committee on Research, taking cognizance of the fact that some organizations are performing fastness tests on textiles, using test methods designated as being standard AATCC test methods, where the methods do not actually conform with AATCC recommended procedures, goes on record as stating that such different or modified methods should not be referred to as AATCC methods, and requests that such references be omitted."

• "The Use of Tolerance Systems", by H. G. Conway, *Product Engineering*, February, 1956, tells how to apply the ABC System of Limits and Fits and the recently approved American Standard. The article discusses the selection of tolerances and fits, and analyses the different types of fits.



• Proof of the value of standardization is stressed in an extensive survey report of *Dollar Savings Through Standards*, which highlights economic benefits to American industry resulting from the use of standards.

The 40-page survey is being made available by the American Standards Association as a service to American industry. The report is an up-to-date version of the original edition of 1951 and contains 79 documented case studies covering 27 industrial fields.

Many of the case studies in this recent issue *Dollar Savings Through Standards* are completely new while others have substantial revisions and additions. The time interval and change of contents combine not only to confirm earlier reports but to expand the significant findings of the survey.

Information for the booklet was obtained by ASA through a special survey among its 114 trade association and technical society members as well as its more than 2,000 company members.

And, for the first time, many of the companies referred to in the report are identified by name.

Industries covered in the new booklet are mechanical manufacturing; power generation; machine tools; automotive; mining and conveying machinery; mechanical fasteners; heating and air-conditioning equipment; typesetting machinery; packaging equipment; precision equipment; electrical manufacturing and electronics; electrical utilities; communications; gas utilities; railroads; building materials; iron and steel; nonferrous metals; chemical products; petroleum; rubber manufacturing; photographic and mo-

tion picture; textile; accident prevention; aluminum; modular measure; and others.

Conclusions reached from the up-to-date material are:

• 1. Standardization is an essential element of the American industrial system.

• 2. American industry is thoroughly aware of the importance of standards.

• 3. Standardization programs are found in all degrees of development.

• 4. There has been a sharp rise in the standards movement since World War II and particularly since 1950.

• 5. There has been great stress in larger industrial establishments on the importance of making the fullest possible use of standards at every stage of the productive process.

• 6. There is a wide variety of applications of the standards technique.

• 7. There is a vast amount of work remaining to be done in standards.

A copy of *Dollar Savings Through Standards* may be obtained by writing the American Standards Association.

Conference on Government Standards

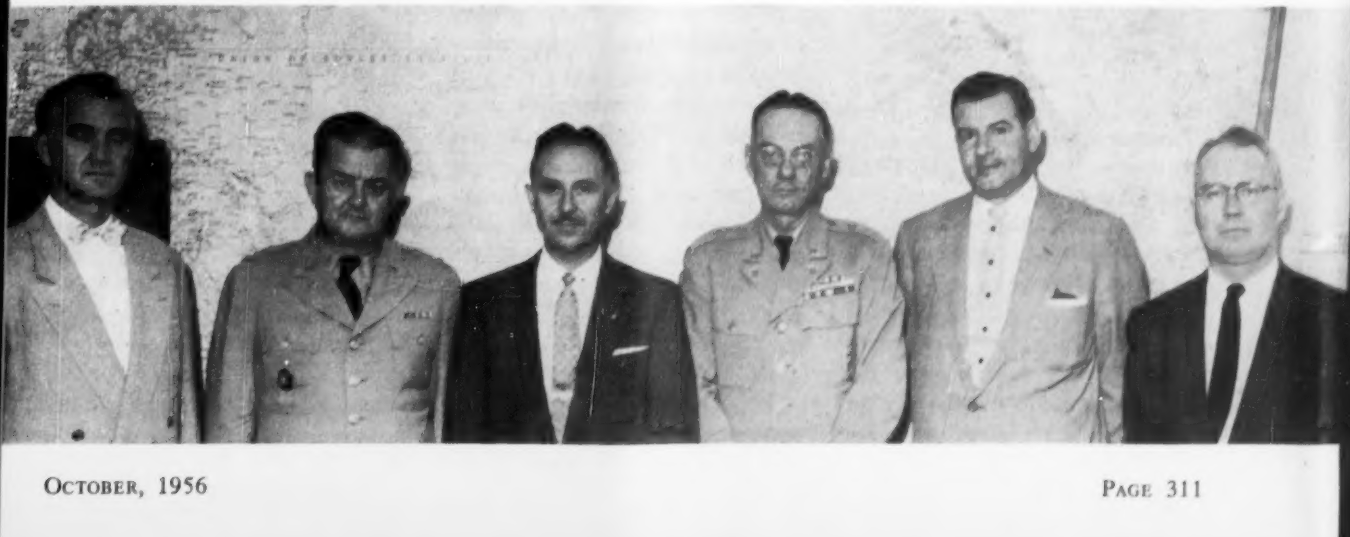
Requirements and interrelationships of military standardization and cataloging programs were reviewed by Department of Defense representatives who met at the Quartermaster Research and Development Command, Natick, Mass., early in August.

Evolving from Public Law No. 436 (82nd Congress), the standardization and cataloging programs were shown to have made steady progress in the Armed Forces.

Department of Defense officials attended the two-day meeting to provide scope and background of the programs at various administrative and operational levels. Participating in the meeting were staff members representing the Office of the Assistant Secretary of Defense for Supply and Logistics; the Office of the Deputy for Chief of Staff for Logistics, Department of the Army; the Office of the Quartermaster General; the Military Clothing and Textiles Supply Agency; the Quartermaster Catalog Agency, and all technical and administrative personnel concerned with cataloging and standardization activities at the Quartermaster Research and Development Command.

The Command is engaged in extensive activities in standardization as the design agency of the Quartermaster Corps in the areas of food, clothing, and subsistence, and as the developing agency in control of new or changed designs. Its activities involve procurement and supply operations of the Quartermaster Corps. Its part in the standardization program involves development or maintenance of standards for insuring entry of the least number of items into the supply system. The cataloging activity is a basic tool in understanding the supply system and provides a common language for referring to items of supply.

Department of Defense officials who attended the Natick meeting—(left to right: C. Snead, Chief, Cataloging Section, Standards Branch; Colonel E. Koerner, Chief, Standards Branch, both representing the Deputy Chief of Staff for Logistics, Department of the Army; G. W. Ritter, Director of Cataloging, of the Office of the Assistant Secretary of Defense for Supply and Logistics; Brigadier General C. G. Calloway, Commanding General of the Quartermaster Research and Development Command; R. E. Gay, Director of Standardization, Inspection, and Cataloging; and J. J. Dunn, Staff Director of Standardization, both of the Office of the Assistant Secretary of Defense for Supply and Logistics.



WHAT IS YOUR QUESTION?

Have screw threads in sizes below ¼ in. been approved as Unified threads?

Four sizes of threads below ¼ in. have been Unified, although only for purposes of attachment and not for all applications. The No. 10 thread has been Unified in two pitches—10-32 and 10-24, with the preference given to 10-32. Because of the limitation of their use, the revised American Standard on Screw Threads now being prepared will list them in bold face type but will not designate them as "UN."

Are there any standards and definitions for camber on flat steel and flat brass that could be used to prevent misunderstanding between vendors and the buyers' receiving inspection?

There are two standards published by the American Society for Testing Materials that may answer this question as it relates to steel sheet: — Specifications for Cold-Rolled Carbon Steel Sheet, Commercial Quality, ASTM A 366-53 T; and Specifications for High Strength Low Alloy Cold-Rolled Steel Sheets and Strip, ASTM A 374-54 T. Both contain a table showing the permissible camber in inches for various specified lengths.

The following definition also appears in ASTM standard A 374-54 T: "Camber is the greatest deviation of a side edge from a straight line; and measurement is taken on the concave side with a straight edge."

ASTM does not use the term "camber" in connection with brass sheet. However, there are tables giving straightness tolerances for slit metal, straightened or edge-rolled metal, square sheared metal, and for sawed metal in ASTM Standard General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar, ASTM B 248-55 T. These tolerances are also termed the maximum edgewise curvature (depth of arc) in any 72-inch portion of the total length.

Copies of these standards can be obtained from the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

Are there standard definitions that explain the difference between "electricity" and "electronics"?

American Standard Definitions of Electrical Terms, C42-1941, defines "electricity" as follows:

"05.10.015—Electricity is a physical agent pervading the atomic structure of matter and characterized by being separable, by the expenditure of energy, into two components designated as positive and negative electricity, in which state the electricity possesses recoverable energy."

The definition for "electronics" is given in the most recent proposed revision of C42 as follows:

"70.01.015—Electronics is that field of science and engineering which deals with electronic devices and their utilization."

Why does the American Standard B6.13-1955, System for Straight Bevel Gears, give the value $\frac{0.188}{P}$ for the bottom clearance of teeth?

In the early days of spur gearing a clearance of $0.157/P$ was established as a standard. This value was 5 percent of the circular pitch. Some bevel gears were also made using this value for clearance. However, it was soon found that this gave an insufficient amount of clearance at the small end of the bevel gear tooth due to the tapering depth. Therefore, the clearance was increased from 5 percent to 6 percent of the circular pitch, resulting in the value of 0.188. This has been used nearly universally for coarse-pitch gears since about 1920. On the finer-pitch gears it has been found necessary to increase this value, and in this case the clearance has been made $\frac{0.188}{P} - 0.002$.

Increasing the value of the clearance increases the tooth depth and therefore the length of the cantilever which results in higher tooth bending stresses. In addition, an increase in the tooth depth decreases the space width at the root of the tooth, thereby reducing the allowable point width of the cutting tool.

By making the clearance uniform from one end of the tooth to the other, which is accomplished by making the face angle of the bevel gear blank complementary to the root angle of its mate, it is possible to use a larger edge radius on the cutting tool in order to produce a generous fillet radius.

Experience has shown that the above selected value of clearance gives the best all-round tooth design consistent with strength and economy of manufacture. It has been used universally in all fields of application including the aircraft field, where maximum strength is of prime importance.

Are there standard definitions, descriptions, or interpretations of "straightness" or "straightness tolerances" for shafts? We find standards for flatness, parallelism, and squareness, but no reference to straightness.

The committees of the ASA have never developed a recommendation on the subject of shaft straightness. However, in a document entitled "Definitions and Measurements" which is being considered by Technical Committee 39, Machine Tools, of the International Organization for Standardization, terms such as straightness, parallelism, flatness, coincidence, and squareness are defined.

FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. An asterisk * indicates that the standard is available in English as well. For the convenience of readers, the standards are listed under their general UDC classifications. In ordering copies of standards, please refer to the number following the title.

362 LOCAL WELFARE ESTABLISHMENTS

Finland (SFS)

2 stds for bowls, etc. for hospital use SFS Z.IV.57 and Z.IV.103

389.171 PREFERRED NUMBERS

Yugoslavia (JUS)

Standard preferred numbers. Numerical values and definitions JUS A.AO.001
Directives for the use of preferred numbers JUS A.AO.002

531.7 MEASUREMENT OF MECHANICAL MAGNITUDE

Belgium (IBM)

Pressure gages, general conditions NBN 363

534 ACOUSTICS

Germany (DNA)

Two specimens of polar coordinate graph paper DIN 45409

542 EXPERIMENTAL CHEMISTRY

Germany (DNA)

Ground-glass components of distillation apparatus DIN 12594

543 ANALYTICAL CHEMISTRY

Belgium (IBN)

Drinking and waste waters. Test for dissolved oxygen NBN 390

549 MINERALOGY

Italy (UNI)

16 stds for chemical tests of minerals UNI 3617/23, 3757/65

Portugal (IGPAI)

Pyrites P-140

551.4 PHYSICAL GEOGRAPHY. GEOMORPHOLOGY

Israel (SII)

Reference marking of boreholes SI 159

614.8 PREVENTION OF ACCIDENTS. SAFETY MEASURES

United Kingdom (BSI)

Filters for protection against intense sunglare BS 2724:1956

615.4 PRACTICAL PHARMACY

Israel (SII)

Stretchers S.I. 179

615.47 SURGICAL AND MEDICAL INSTRUMENTS AND APPLIANCES

Union of South Africa (SABS)

Specifications for stainless steelware for medical use SABS 417-1955
Specifications for hospital beds SABS 521-1955

United Kingdom (BSI)

Castors — Part 1. Castors for hospital equipment BS 2099:Part 1:1956

620.1 TESTING MATERIALS

Portugal (IGPAI)

Rockwell hardness test P-141

Union of South Africa (SABS)

Code of practice for methods for the tensile testing of metallic materials SABS 054-1955
Code of practice for methods for impact testing of metallic materials SABS 056-1955
Code of practice for methods for bending tests on metallic materials SABS 057-1955

United Kingdom (BSI)

Pocket type rubber hardness meters (methods of use and calibration) BS 2719:1956

621.1 STEAM ENGINES. BOILERS

Mexico (DGN)

Safety valves for steam boilers and other pressure vessels DGN B76-1955

621.13 RAILWAY STEAM LOCOMOTIVE

Germany (DNA)

Thumb-nut pipe connector DIN 33360
Threaded studs, metric or Whitworth DIN 30283
Safety device for piston ring DIN 35012

621.4 INTERNAL COMBUSTION ENGINES

Germany (DNA)

Fuel tank for diesel motors DIN 6277

Israel (SII)

Pistons for gasoline engines SI 155

Union of South Africa (SABS)

Specifications for cast iron cylinder sleeves for internal combustion engines SABS 401-1955
Specifications for cast iron piston rings for internal combustion engines SABS 522-1955

621.56 REFRIGERATION

Germany (DNA)

Seamless tubes for small refrigerators DIN 8905
6 stds for pipe union, tees, elbows, DIN 8907/8, 8910, 8913, 8916/7
4 stds for details of shut-off valves of refrigerating machines DIN 8920, —23/4, —26

India (ISI)

Safety code for mechanical refrigeration IS 660-1955

United Kingdom (BSI)

Domestic appliances burning town gas. Part 5, Specific requirements for refrigerators BS 1250: part 5:1956

621.643 CONDUITS, PIPES AND ACCESSORIES

Union of South Africa (SABS)

Specifications for malleable cast iron pipe fittings SABS 509-1955

621.753 TOLERANCES. GAGES

Italy (UNI)

ISA system of tolerance used in mechanical and electromechanical means of transportation UNI 3739

621.82/.85 BEARINGS, COUPLINGS, JOURNALS, ETC.

Germany (DNA)

4 stds for pillow blocks DIN 736/9
Roller retaining rings DIN 5407, Bl.1
3 stds for pins for bearing mounting DIN 1433/5
Roller bearing, basic dimensions DIN 616, Bl.1
Balls for ball bearings DIN 5401

Poland

2 stds for sprocket wheels PN M-03052/3

Spain (IRATRA)

Roller chains UNE 18002

621.882 SCREW THREADS. SCREWS

Germany (DNA)

4 stds for different threaded plugs DIN 906, 908/10
2 stds for long-, short-, through bolts, metric thread DIN 609/10
One-end metric threaded stud DIN 427
Metric set screw DIN 551

621.89 LUBRICATION

Germany (DNA)

Determination of flash point of lubricating oils DIN 51584

India (ISI)

3 specifications for grease IS 719/21-55
Methods of sampling and test for lubricants, Part II IS 310 (Part II)-1954

624 CIVIL ENGINEERING

Austria (ONA)

Calculation of wind load and earthquake resistance, general ÖNORM B 4000, Part 3
Contract stipulations relative to construction tools and temporary shelters ÖNORM B 2113
Technical specifications for earth and stone work ÖNORM B 2205

628.2/.3 SEWERS AND SEWAGE WATER

Union of South Africa (SABS)

Code of practice for sewer and drain joining SABS 058-1955
Glazed earthenware drain and sewer pipes and fittings SABS 559-1955

629.12 SHIPS AND SHIPBUILDING

France (AFNOR)

Cast steel bollard "mixed" type NF J 37-222
5 stds for steel-sheet marine ventilators and their details NF J 45-131, -133, -135, -137, -140

629.113 MOTOR VEHICLES, GENERAL

Austria (ONA)

Cast iron lining for cylinders ÖNORM V 5610

Germany (DNA)

Gage for wheel rims DIN 7841

Japan (JISC)

6 stds for inspection of automobile electric circuit JIS D 1602/4, -1606/8
7 stds for automobile wheel rims JIS D 4203/6, -4215/7
Clutch facings JIS D 4311
Brake linings JIS D 4411
Spark plugs JIS D 5101
Generator mounting flange JIS D 5201
Starter mounting flange JIS D 5203
Piston pins JIS D 9001/2
6 stds for different parts of automobile engine JIS D 9004/9

Yugoslavia (JUS)

Ignition coils for passenger cars and trucks JUS N.P1.051
Voltage regulators for generators JUS N.P2.501

631.3 AGRICULTURAL TOOLS AND MACHINERY

Germany (DNA)

Wide rims for agricultural tractor DIN 7823
Rims for agricultural tractors DIN 9641
Cultivator spring tines DIN 11130
3 stds for power mower parts DIN 11363/5

United Kingdom (BSI)

Dimensions of agricultural cultivator tines BS 2659:1955
Agricultural discs BS 2687:1955

632 PHYTOPATHOLOGY

France (AFNOR)

2 stds for testing phytopharmaceutical powders NF U 43-118, -218

Poland

Chemical remedies for pest control of plants PN C-84000

656 TRANSPORT ORGANIZATION

Italy (UNI)

Statistical data relative to funicular railways UNI 3700
Survey of principal types of passenger transportation—nomenclature and definition UNI 3733/4

66 CHEMICAL INDUSTRY

United Kingdom (BSI)

Welded steam-heated jacketed pans for processing industries (excluding catering equipment) BS 2647:1956

662.6 NATURAL FUELS

Belgium (IBN)

Petroleum products: Cloud and pour points NBN 52.014, 52.018
Petroleum products: Penetration of bitumen NBN 52.030
Petroleum products: Carbon residue (Ramsbottom method) NBN 52.045
Petroleum products: Drop point of grease NBN 52.061
Petroleum products: Water content NBN 52.062
Petroleum products: Diesel index NBN 52.070
Distillation of petroleum products boiling below 370C NBN 52.072

United Kingdom (BSI)

Determination of knock-rating of motor fuel BS 2637-38:1956

665.1/.3 VEGETABLE AND ANIMAL OIL, FATS, AND WAXES

Spain (IRATRA)

9 stds for sampling and testing vegetable and animal oils and fats UNE 55001/2, 55010, 55018, 55024/8

665.4/.5 MINERAL OILS, FATS AND WAXES

Bulgaria

7 stds for different tests of mineral oils (bound together) BDS 1750/3, 1705/7

France (AFNOR)

2 stds for testing for carbon residue in petroleum by Conradson and Ramsbottom methods NF T 60-116, -117

India (ISI)

Blown type bitumen IS 702-1955

Poland

3 stds for testing petroleum products PN C-04023, -04075, -96024
Classification for motor fuel oils PN C-96048
Thermal property of petroleum products PN C-04062

Spain (IRATRA)

Testing for moisture and volatile matter content UNE 55020

Switzerland (SNV)

4 stds for different tests of mineral oils SNV 81051/3, 81103 a

667.6/.8 PAINTS. VARNISHES. LACQUERS

India (ISI)

Lacquer, cellulose, clear IS 349-1955

Ireland (IIRS)

2 stds for water paint for interior use I.S. 22-1955, I.S. 73-1955
2 stds for washable and non-washable distemper for interior use I.S. 74/5-1955

Union of South Africa (SABS)

Red iron oxide in oil SABS 547-1955

United Kingdom (BSI)

White spirit BS 245:1956
Black paint(tar base) BS 1070:1956
Colours for building and decorative paints BS 2660:1955

672 IRON AND STEEL ARTICLES

Poland

6 stds for different types of scissors PN A-55050/2, F-58050, M-65501, Z-62060

USSR

Welded chains, heavy GOST 2319-55
Sewing machine needles GOST 7322-55
Barbers' razors GOST 7126-54

674 WOOD INDUSTRY

China (CNS)

19 stds for classification, grading and sizing resinous lumber CNS 442/460(0 1/19)

France (AFNOR)

Method of testing fungicide products used for the preservation of wood in northern regions NF X 41-502

Canada (CSA)

Specification for wood sash and screen frames C132.1-1956

Germany (DNA)

Wood wool DIN 4077

India (ISI)

Logs for plywood IS 656-1955
Pentachlorophenol (for wood preservation) IS 716-1955

Portugal (IGPAI)

Classification of cork suitable for trituration NP-63

Union of South Africa (SABS)

Nomenclature of std trade names of imported commercial timbers used in South Africa Supplement No. 1 to 02-1947, Je. 14, 1954

United Kingdom (BSI)

Wood trim BS 584:1956

USSR

Lumber, unsurfaced, allowance for dressing GOST 7307-54
Veneered plywood GOST 7249-54

Yugoslavia (JUS)

Classification and measurement of round and processed wood JUS D.00.022
45 stds for a variety of wood products for different purposes JUS series D.BI/B8., D.CI/C5.
3 stds for railway sleepers JUS D.DI.020/2
Parket flooring JUS D.D5.020
Wood wool JUS D.D6.020

677 TEXTILE INDUSTRY

Japan (JISC)

4 stds for inspection of cotton yarn and fabric for export JIS L 1108, 1111/2, 1117
Gradation of viscose rayon for export JIS L 1504
Gradation of Bemberg rayon for export JIS L 1505
5 stds for inspection and testing different artificial yarns JIS L 1023/4, 1305/6, 1507
3 stds for labeling textile products JIS L 1403/4, 1602

Spain (IRATRA)

Designation of the direction of twist in textile yarn UNE 40014

Switzerland (SNV)

Oil removing from rayon staple fiber SNV 95 642
Determination of wool fiber fineness SNV 96 421
Determination of uneveness of yarn in fabrics SNV 97 420
Abrasion resistance test of different fabrics SNV 98 534

United Kingdom (VSI)

Recommendations of classifying textile goods for laundering purposes BS 2747:1956

USSR

Asbestos thread and cords GOST 1779-55
Tire cords of viscous material GOST 7266-54
Cotton tarpaulin GOST 7130-54
Flax and hemp fibers GOST 7563-55
Woolen and mixed dry goods: methods of folding, marking and packing GOST 878-54
Rubberized canvas hoses for pressure liquids GOST 1330-55
Cotton fibre GOST 3152-54
Knitted fabrics and wearing apparel GOST 854, 1165-55; 1230, 1443-54
3 stds for woolen and mixed woolen fabrics Gost 7347-55, 7289/90 -54
Colourfastness of pure woolen fabrics GOST 7120-55
Linen fabrics, bleached, unbleached and dyed GOST 7422-55
Mixed linen fabric, white and dyed GOST 7421-55
6 stds for cotton fabrics for different uses GOST 7138/9-54; 7259-54, 7312, 7471, 7617
Cotton fabrics for shoe manufacture GOST 7287-54

What Is a "Tesla"?

by J. J. Smith
General Electric Company

THE name "tesla" was adopted for the unit of magnetic induction in the mksa system at the meeting of the International Electrotechnical Commission in Munich in 1956. Names previously used for this unit had been "weber per square meter," "volt second per square meter," etc.

The tesla is the counterpart in the mksa system of the gauss in the cgs system and the numerical relation between them is that 1 tesla is equal to 10^4 gauss. Similarly the weber, the unit of magnetic flux in the mksa system, is the counterpart of the maxwell which is the unit of magnetic flux in the cgs system. The numerical relation between them is that 1 weber is equal to 10^8 maxwell.

To define the tesla it is convenient to define the weber first. This was originally defined in the report of the British Association for the Advancement of Science in 1895. The weber is the magnetic flux which when linked with a single turn of wire generates an electromotive force (emf) of one volt at the terminals of the turn as the flux decreases uniformly to zero in one second. The maxwell can be defined in the same manner except that in the cgs system the voltage generated is one ab volt or 10^8 volts. From this the relation between the weber and maxwell given above follows.

The magnetic induction **B** is the magnetic flux density or flux per unit area. When conditions are uniform the number of webers through a coil divided by the numerical value of the area of the coil in square meters gives the numerical value in teslas of the component of the magnetic induction normal to the plane of the coil. This is found to vary from zero to a maximum as the orientation of the plane of the coil is changed. When the value is a maximum, the plane of the coil is normal to the magnetic induction. The value obtained in this maximum direction is called the magnetic induction **B** at the center of the coil.

??????

According to the American Standard Definitions of Electrical Terms, C42-1941, the cgs system of units is an absolute system for measuring physical quantities in which the fundamental units are the centimeter, gram, and second. The mksa system is an absolute system of units which is based on the meter, kilogram, second, and ampere, and which is extended to the electrical units by the measurement of current by its magnetic effects and of potential difference by the power per unit current. The ampere was added to the original mks system since publication of the American Standard definitions in 1941.

??????

In general the flux may not vary uniformly with time as in the British Association's definition of the weber. It is therefore desirable to have a more formal and generally applicable definition which may be stated as follows:

If a coil of one square meter area is brought up from a location in which the magnetic field is zero to a location surrounding a point P at which the magnetic induction is uniform, and if the maximum value of the integral with respect to time of the voltage at the terminals of the coil is one volt second, then the magnetic induction in the space surrounding the point P is equal to one tesla. The maximum value will occur for a given orientation of the coil. The direction of the magnetic induction at the point P is normal to the plane of the coil for this orientation.

The coil does not necessarily have to be 1 square meter area. If it has an area A square meters, divide the integral with respect to time of the voltage by the area A to obtain the magnetic induction. For nonuniform fields the magnetic induction is defined as the number of webers through the coil divided by the area in square meters as the area tends to zero and the coil is oriented so as to give a maximum value. It is readily shown that 1 tesla is equal to 1 weber per square meter or 10^8 maxwells per square meter or 10^4 maxwells per square centimeter which is 10^4 gauss.

It is to be hoped that the introduction of this new name "tesla" for the unit of magnetic induction in the mksa system will facilitate the use of this system in magnetic work. In many books the magnetic induction is now given in curves whose ordinates are either gausses, in which case a factor of 10^3 is usually used, or may be given in kilogausses. Such curves may be readily changed to teslas since 10 kilogauss is equal to 1 tesla. Thus the tesla is a unit of quite convenient size for practical work.

Mr Smith is chairman of IEC Technical Committee 24 *on Electric and Magnetic Magnitudes and Units as well as of ASA Sectional Committee C*61 *on the same subject.*

Of Peas And Peashooters • • • NEW CRISIS IN OLD ENGLAND

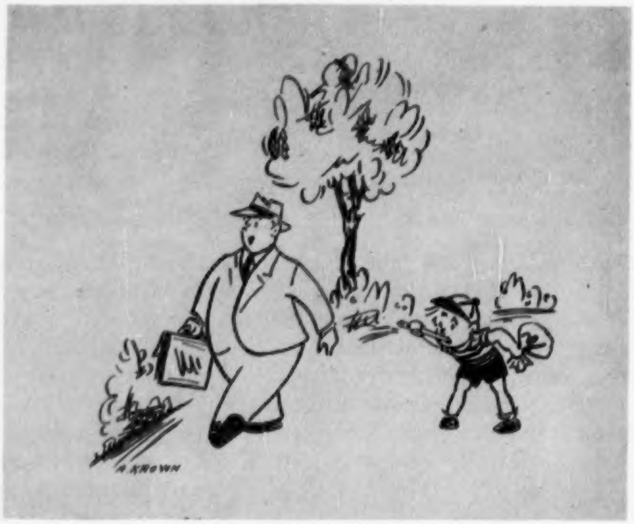
London, July 6 (AP)

YOUNG John Christian Rayner's peashooter is giving him trouble. Today, this touched off a row over British pea growers and British peashooter makers.

The question: Are British peashooters getting too small to shoot British peas, or are British peas getting too large to be shot in British peashooters?

To John, 5, this is an important matter.

The boy recently reported to his father, Major John W. Rayner, of the British War Office, that only about one dried pea in 20 would pass through his new shooter. The major issued an indignant statement to the press, saying in part:



• • "In my youth peas fitted peashooters perfectly. Have peas grown larger or peashooters smaller nowadays?

• • "Whatever it is, it shows a shocking lack of industrial coordination. We are fighting for our export markets and it is a scandal if peashooters are offered for sale which are too small to shoot peas. If such a thing happened in the Army it would cause a terrible fuss."

Colonel Maurice Batchelor, head of one of Britain's biggest pea-producing firms, said it was nonsense to suggest that peas were getting bigger.

• • "We go for quality, not size," Batchelor said. "There are two main types of British peas, the little 'blues' and the larger 'marrowfats.' Johnny should try 'blues' in his shooter.

• • "But at the risk of being accused of starting an armaments race, I think peashooter manufacturers should start making bigger guns which would take 'marrowfats'."

A spokesman for the British Toy Makers Association hotly denied there had been any shrinkage in the shooters.

• • "They are as fine in quality as they have ever been," said the spokesman. "Caliber is carefully adjusted as it was when Major Rayner was a child.

"However, we would be the first to agree to consultations at a national level between toy manufacturers and pea growers to standardize both pea and peashooter dimensions."

STANDARDS CATALOG

"As another secret of their success in big-time buying, department executives point proudly to their 800-page, 12,000 item Standards Catalog.

"The book's success can be attributed to two principles: simplicity of language and strict adherence to alphabetical order, right down to the fourth or fifth adjective used to describe an item. With new commodities constantly coming into use, others becoming obsolete, and standards and specifications changing, the job of keeping the catalog up-to-date takes the time of nine staff members. In a typical month they added 231 new items, cancelled 171 others, and made 241 other changes.

"One reason for the continual changes is the department's long-standing policy of defining more accurately the standards it requires for all goods purchased, and of making increasing use of widely-accepted standards. Whenever standards of quality, dimensions, or performance have been set up by such bodies as the Canadian Standards Association, the American Standards Association, the American Petroleum Institute, or the American Society for Testing Materials, the department adopts them. In cases where no such standards exist the department sets up its own, based on what it learns through study, experiments and experience in the field."

—From "How Imperial Spent $80,000,000," Canadian Oil & Gas Industry, December, 1955.

AMERICAN STANDARDS UNDER WAY

Status as of October 1, 1956

BUILDING AND CONSTRUCTION

In Board of Review

Fire Tests of Building Construction and Materials, Methods of, ASTM E 119-55; NFPA 251; ASA A2.1 (Revision of ASTM E 119-41; ASA A2.1-1942)

Fire Tests of Door Assemblies, Methods of, ASTM E 152-55T; NFPA 252; ASA A2.2 (Revision of ASTM E 152-41; ASA A2.2-1942)

Test for Combustible Properties of Treated Wood by the Fire Tube Test Method, Method of, ASTM E 69-50; NFPA 253; ASA A2.3

Test for Combustible Properties of Treated Wood by the Crib Test Method, Method of, ASTM E 160-50; NFPA 254; ASA A2.4
Sponsors: American Society for Testing Materials; National Bureau of Standards; National Fire Protection Association

In Standards Board

Structural Rivet Steel, Specifications for, ASTM A 141-55; ASA G21.1

Structural Silicon Steel, Specifications for, ASTM A 94-54; ASA G41.1

High-Strength Structural Rivet Steel, Specifications for, ASTM A 195-52 T; ASA G42.1

Axle-Steel Bars for Concrete Reinforcement, Specifications for, ASTM A 160-54T; ASA G43.1

High-Strength Steel Castings for Structural Purposes, Specifications for, ASTM A 148-55; ASA G52.1
Sponsor: American Society for Testing Materials

Standards Submitted

Asphalt-Saturated Roofing Felt for Use in Constructing Built-Up Roofs, Specifications for, ASTM D 226-56; ASA A109.2 (Revision of ASTM D 226-47; ASA A109.2-1955)

Coal-Tar Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs, Specifications for, ASTM D 227-56; ASA A109.3- (Revision of ASTM D 227-47; ASA A109.3-1955)

Asphalt-Saturated Asbestos Felts for Use in Waterproofing and in Constructing Built-Up Roofs, Specifications for, ASTM D 250-56; ASA A109.4- (Revision of ASTM D 250-47; ASA A109.4-1955)

CONSUMER GOODS

American Standard Published

Milled Toilet Soap, Specifications for, ASTM D 455-55; ASA K 60.6-1956 $0.30

Legend

Standards Council—Approval of Standards Council is final approval as American Standard; usually requires 4 weeks.

Board of Review—Acts for Standards Council and gives final approval as American Standard; action usually requires 2 weeks.

Standards Board—Approves standards to send to Standards Council or Board of Review for final action; approval by standards boards usually takes 4 weeks.

ELECTRIC AND ELECTRONIC

American Standards Published

Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units, ASTM C 126-55T; ASA A101.1-1956 (Revision of ASTM C 126-52T; ASA A101.1-1954) $0.30
Sponsor: American Society for Testing Materials

Terminal Markings for Electric Apparatus, C6.1-1956 (Revision of C6.1-1944) $1.00
Sponsor: National Electrical Manufacturers Association

Bronze Trolley Wire, Specifications for, ASTM B 9-55; ASA C7.5-1956 (Revision of ASTM B9-52; ASA C7.5-1953) $0.30

Copper Trolley Wire, Specifications for, ASTM B 47-55; ASA C7.6-1956 (Revision of ASTM B47.52; ASA C7.6-1953) $0.30

Soft Rectangular and Square Bare Copper Wire for Electrical Conductors, Specifications for, ASTM B 48-55; ASA C7.9-1956 (Revision of ASTM B48-52; ASA C7.9-1953) $0.30

Figure-9 Deep-Section Grooved and Figure-8 Copper Trolley Wire for Industrial Haulage, Specifications for, ASTM B 116-55; ASA C7.11-1956 (Revision of ASTM B 116-52; ASA 7.11-1953) $0.30

Rolled Aluminum Rods (EC Grade) for Electrical Purposes, Specifications for, ASTM B 233-55; ASA C7.23-1956 (Revision of ASTM B 233-52; ASA C7.23-1953) $0.30

Hard-Drawn Copper Alloy Wires for Electrical Conductors, Specifications for, ASTM B 105-55; ASA C7.10-1956 (Revision of ASTM B 105-53; ASA C7.10-1953) $0.30

Hard-Drawn Aluminum Wire for Electrical Purposes, Specifications for, ASTM B 230-55T; ASA C7.20-1956 (Revision of ASTM B 230-53T; ASA C7.20-1953) $0.30

Concentric-Lay-Stranded Aluminum Conductors, Hard-Drawn and Three Quarter Hard-Drawn, Specifications for, ASTM B 231-55; ASA C7.21-1956 (Revision of ASTM B 231-53; ASA C7.21-1953) $0.30

Concentric-Lay-Stranded Aluminum Conductors, Steel-Reinforced (ACSR), Specifications for, ASTM B 232-55T; ASA C7.22-1956 (Revision of ASTN B 232-52; ASA C7.22-1953) $0.30

Standard Weight Zinc-Coated (Galvanized) Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR), Specifications for, ASTM B 245-55; ASA C7.28-1956 (Revision of ASTM B245-52; ASA C7.28-1953) $0.30

Zinc-Coated (Galvanized) Steel Core Wire (With Coatings Heavier than Standard Weight) for Aluminum Conductors, Steel Reinforced (ACSR), Specifications for, ASTM B 261-55; ASA C7.34-1956 $0.30

Three-Quarter Hard Aluminum Wire for Electrical Purposes, Specifications for, ASTM B 262-55; ASA C7.35-1956 $0.30

Standard Nominal Diameters and Cross-Sectional Areas of AWG Sizes of Solid Round Wires Used as Electrical Conductors, Specifications for, ASTM B 258-51 T; ASA C7.36-1956 $0.30

Laminated Thermosetting Materials, Tentative Specifications for, ASTM D709-55 T; NEMA LP 1-1955; ASA C59.-16-1956 $0.50

Vulcanized Fibre Sheets, Rods, and Tubes Used for Electrical Insulation, Specifications for, ASTM D 710-54T; NEMA VU 1-1954; ASA C59.29-1956 $0.30
Sponsor: American Society for Testing Materials

American Standard Approved

National Electrical Code, C1-1956 (Revision of ASA C1-1953)
Sponsor: National Fire Protection Association

Fluorescent Lamp Reference Ballasts, Specification for, ASA C82.3-1956 (Revision of ASA C82.3-35)
Sponsor: Electrical Standards Board

In Board of Review

Electron Tube Bases, Caps, and Terminals, ASA C60.1- (Revision of RETMA ET-103-B; NEMA 500-B; ASA C60.1-1952)

Dimensional Characteristics of Electron Tubes, ASA C60.2- (Revision of RETMA ET-105-A; NEMA 502-B; ASA C60.2-1953)

Gages for Electron Tube Bases, ASA C60.7- (Revision of RETMA ET-106-A; NEMA 503-A; ASA C60.7-1952)
Sponsor: Joint Electron Tube Engineering Council

Dimensional and Electrical Characteristics of 40-Watt T-12 Pre-heat Start Fluorescent ; Lamp, ASA C78.408- (Revision of ASA C78.408-1951)

Dimensional and Electrical characteristics of 72 Inch T-12 Rapid Start (Mogul Bipin) Fluorescent Lamp, C78.701-

Fluorescent Lamp Ballasts, Specifications for, C82.1- (Revision of ASA C82.1-1931)
Sponsor: Electrical Standards Board

In Standards Board

Schedules of Preferred Rating for Alternating and Direct Current Low Voltage Air Circuit Breakers, C37.16-

Preferred Pick-up Calibrations and Trip Delay Settings for Alternating Current Low Voltage Air Circuit Breakers, C37.17-

Automatic Null - Balancing Electrical Measuring Instruments, Specifications for, C39.4-

Definitions of Electrical Terms, ASA C42-
Group 20, Switchgear, C42.20-
Group 25, Control Equipment, C42.-25-
Group 40, Transportation, C42.40-
Group 41, Transportation—Air, C42.-41-
Group 42, Transportation — Land, C42.42-
Group 43, Transportation — Marine, C42.43-
Group 50, Electric Welding and Cutting, C42.50-
Group 55, Illuminating Engineering, C42.55-
Group 60, Electrochemistry and Electrometallurgy, C42.60-
Group 70, Electron Devices, C42.70-
Group 85, Mining, C42.85-
Sponsor: Electrical Standards Board

Definitions of Semiconductor Terms, IRE 7.S2; ASA C60.14-
Sponsor: Joint Electron Tube Engineering Council

Nomenclature and Dimensions for Panel Mounting Racks, Panels, and Associated Equipment, RETMA SE-102; ASA C83.9-

Metal-Encased Fixed Paper Dielectric Capacitors for D-C Application, Requirements for, RETMA TR-113-A; ASA C83.11-

Cable Connectors for Audio Facilities for Radio Broadcasting, Requirements for, RETMA TR-118; ASA C83.12-

Wire-Wound Power-Type Rheostats, Requirements for, RETMA TR-133; ASA C83.13-

Rigid Coaxial Transmission Lines — 50 Ohms, Requirements for, RETMA TR-134; ASA C83.14-

Electrolytic Capacitors (For Use Primarily in Transmitters and Electronic Instrument), Requirements for, RETMA TR-140; ASA C83.15-
Sponsor: Radio-Electronics-Television Manufacturers Association

GAS-BURNING APPLIANCES

American Standard Published

Test for Calorific Value of Gaseous Fuels by the Water-Flow Calorimeter, Method of, ASTM D 900-55; ASA Z68.1-1956 $0.60
Sponsor: American Society for Testing Materials

In Standards Board

Domestic Gas Ranges, Approval Requirements for, Z21.1-, Volume I, Free-Standing Units; Volume II, Built-In Domestic Cooking Units
Sponsor: American Gas Association

Rectangular Waveguides, Requirements for, RETMA TR-108-A; ASA C83.10-

MATERIALS AND TESTING

Standard Submitted

Testing Gypsum and Gypsum Products, Method of, ASTM C26-56; ASA A70.1- (Revision of ASTM C26-54; ASA A 70.1-1956)

Gray Iron Castings, Specifications for, ASTM A 48-56; ASA G25.1- (Revision of ASTM A 48-48; ASA G25.1-1948)

Specifications for Thermometers, ASTM E 1-56; ASA Z71.1 (Revision of ASTM E 1-55; ASA Z71.1-1956)
Sponsor: American Society for Testing Materials

MECHANICAL

American Standards Published

Life Tests for Single-Point Tools of Sintered Carbide, B5.34-1956 $1.00
General description of tool wear, preparation of tools for tests, and tests to determine relationship between tool wear and cutting time for single point tools of sintered carbide. Tests for single point tools made of materials other than sintered carbides are covered in B5.19.
Sponsors: American Society of Mechanical Engineers; American Society of Tool Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers

Design for Fine-Pitch Worm Gearing, AGMA 374.03; ASA B 6.9-1956 (Revision of AGMA 374.02, ASA B6.9-1950) $1.50
Design procedure for fine pitch worms and worm gears giving the necessary formulae to calculate their dimensions. The worms and gears covered herein are used principally to transmit motion rather than power.
Sponsors: American Gear Manufacturers Association; The American Society of Mechanical Engineers.

In Standards Board

Gage Blanks, ASA B47.1-; CS8-1951, with 1955 Supplement (Revision of ASA B47.1-1941)
Developed by: American Gage Design Committee

Conveyor Terms and Definitions, B75
Sponsor: Conveyor Equipment Manufacturers Association

Withdrawal Being Considered

Carbon-Steel Castings Suitable for Fusion Welding for Miscellaneous Industrial Uses, ASTM A 215-44; ASA G51.1-1944
Sponsor: American Society for Testing Materials

NUCLEAR ENERGY

Standard Submitted

Terms in Nuclear Science and Technology, Glossary of
Sponsor: National Research Council

PHOTOGRAPHY

American Standards Published

Sensitometry of Industrial X-ray Films for Energies up to 2 Million Electron Volts, Method for the, PH2.8-1956 $1.00

Sensitometry of Medical X-ray Films, Method for the, PH2.9-1956 $1.00
Sponsor: Photographic Standards Board

In Board of Review

Dimensions for 35mm Motion-Picture Negative Raw Stock, Dimensions for, PH 22.34- (Revision of Z22.34-1949)

Dimensions for 35mm Motion-Picture Film, Alternate Standard for Positive Raw Stock, Dimensions for, PH22.102-
Sponsor: Society of Motion Picture and Television Engineers

In Standards Board

Amateur Roll Film, Backing Paper, and Film Spools, Dimensions for, PH1.21- (Revision of Z38.1.7-1950)

Photographic Dry Plates (Inch and Centimeter Sizes), Dimensions for, PH1.23- (Revision of Z38.1.30-1951 and Z38.1.31-1944)

Film Packs, Dimensions for, PH1.26- (Revision of Z38.1.1-1951)

Spooling Photographic Paper for Recording Instruments, Requirements for, PH1.27-

Melting Point of a Nonsupport Layer of Films, Plates, and Papers in Distilled Water, Method for Determining, PH4.11- (Revision of Z38.8.20-1948)

Photographic Grade Mono-Methyl-Para-Aminophenol Sulphate, Specifications for, PH4.125- (Revision of Z38.8.125-1948)

2, 4-Diaminophenol Hydrochloride, Specifications for, PH4.127- (Revision of Z38.8.127-1948)

Para - Hydroxyphenylglycine, Specifications for, PH4.128- (Revision of Z38.-8.128-1949)

Para-Aminophenol Hydrachloride, Specifications for, PH4.129- (Revision of Z38.8.129-1948)

Pyrogallic Acid, Specifications for, PH4.-130- (Revision of Z38.8.130-1948)

Para - Phenylenediamine, Specifications for, PH4.132- (Revision of Z38.8.132-1948)

Para-Phenylenediamine Dihydrochloride, Specifications for, PH4.133- (Revision of Z38.8.133-1948)

Chlorohydroquinone, Specifications for, Ph4.134- (Revision of Z38.8.134-1948)

Sodium Thiocyanate, Specifications for, PH4.177-

Potassium Chloride, Specifications for, PH4.202- (Revision of Z38.8.202-1948)

Sodium Chloride, Specifications for, PH4.203- (Revision of Z38.8.203-1948)

5-Methylbenzotriazole, Specifications for, PH4.205- (Revision of Z38.8.205-1948)

6-Nitrobenzimidazole Nitrate, Specifications for, PH4.206- (Revision of Z38.8.206-1948)

Sodium Hydroxide, Specifications for, PH4.225- (Revision of Z38.8.225-1948)

Potassium Hydroxide, Specifications for, PH4.226- (Revision of Z38.8.226-1948)

Potassium Carbonate, Specifications for, PH4.229- (Revision of Z38.8.229-1948)
Ammonium Hydroxide, Specifications for, PH4.232- (Revision of Z38.8.232-1948)

Project Requested

Measurement of X-ray Tube Focal Spot Size
Requested by: General Services Administration

PIPE AND FITTINGS

American Standards Published

Seamless Steel Boiler Tubes for High-Pressure Service, Specifications for, ASTM A 192-55T; ASA B36.14-1956 (Revision of ASTM A 192-44; ASA B 36.14-1945) $0.30
Spiral-Welded Steel or Iron Pipe, Specifications for (Revision of ASTM A 211-44; ASA B36.16-1945) ASTM A 211-54; ASA B36.16-1956 $0.30
Copper Brazed Steel Tubing, Specifications for, ASTM A 254-55T; ASA B36.35-1956 $0.30
Seamless and Welded Ferritic Stainless Steel Tubing for General Service, Specifications for, ASTM A 268-55; ASA B36.36-1956 $0.30
Sponsors: American Society of Mechanical Engineers; American Society for Testing Materials

SAFETY

American Standard Published

Specialty Transformers, Safety for, UL 506; ASA C33.4-1956 $1.00
Sponsor: Underwriters' Laboratories, Inc.

In Board of Review

Portable Metal Ladders, Safety Code for, A14.2-
General requirements, specifications and methods of test for light-weight portable metal ladders such as: rung ladders, step ladders, and trestle ladders. Also includes section on care and use of these ladders.
Fixed Ladders, Safety Code for, A14.3-
Design and construction requirements for fixed ladders, their attachment to buildings, towers, chimneys or other structures, and accessories to be used with them.
Sponsors: National Association of Mutual Casualty Companies; American Society of Safety Engineers; American Ladder Institute

Project Requested

Aerial Passenger Tramways
Sponsor: Eastern Ski Area Operators Association

TEXTILES

Standards Submitted

Terms Relating to Textile Materials, Definitions of, ASTM D 123-55; ASA L14.12-
Test for Fineness of Wool Tops, Method of, ASTM D 472-56; ASA L14.29-
Test for Fineness of Wool, Method of, ASTM D 419-55T; ASA L14.26-
Fiber Length of Wool Tops, Test for, ASTM D 519-55T; ASA L14.32-

Withdrawal Being Considered

General Methods of Testing Cotton Fibers, ASTM D 414-54T; ASA L14.-23-1951
Sponsor: American Society for Testing Materials; American Association of Textile Chemists and Colorists

Standards Outlook

by Leo B. Moore

Financing Standards Activity

Standards groups have been experimenting with various approaches to their financing problems. Much of this movement for financial evaluation has stemmed from an earnest desire to enlist top management support and interest in standards work. The appeal of the dollar seems to have much merit in it.

Typically, every phase of an operating company has an allotment of money in the form of a budgetary appropriation, which is the amount of money that management has apportioned to that function to carry out its duties during the fiscal period. Many standards groups have taken the realistic attitude that this very act is proof enough of management's interest. Others have felt the need of accumulating positive evidence that standards did measurable good and, specifically, in terms of money.

The first attempts in this direction were evaluation surveys of company programs in general. These historical accumulations of money saved seem to have merely whetted the appetite. The next step has been the compilation and reporting of data according to standards projects using records of expenditures, accompanying savings, and their comparison. Increasing experience with this type of financial evaluation has prompted other money stratagems in connection with standards, all, however, with the aims of justifying the activity.

Such financial arrangements have the purpose of covering the operating costs of the standards department by charging the users of the service with the cost of the service. The first is direct assessment of the using functions on some basis such as the number of engineers or the number of projects in the function. Another is the direct charge on the basis of the number of manuals provided or other physical evidence of work done. Related to this is the maintenance charge which is on a straight cost basis for keeping the manuals up to date. Another method has been the direct costing of all the expense of a project to the group having the major interest. Related to this is the "on-request-only" operation in which nothing is done unless a function specifically requests it and is willing to buy it. All of these different approaches have individual merit only in terms of the company, its people, and the way they work. The most significant aspect of any of these is the fact that the users pay, and know that they pay. The continued willingness to spend their money for standards work is most reassuring.

These or any other methods that may be found workable and useful certainly provide identification of the contribution and accomplishment of the standards group. This is particularly helpful when, as a service function, the standards work is not in the mainstream of managerial activity, and the group may feel the need of recognition and support.

•

Mr Moore is Assistant Professor of Industrial Management at Massachusetts Institute of Technology where he teaches a full-term course in industrial standardization.

Fifth Edition

TERMINAL MARKINGS FOR ELECTRIC APPARATUS

American Standard C6.1-1956 $1.00

Sponsored by the National Electrical Manufacturers Association

THIS system of connections and markings for identifying terminals for electric equipment has been brought in step with latest developments in the electrical industry. Note especially additional material on terminals for single-phase motors.

THESE basic rules and specific markings for use in making connections to other parts of the electric power system are the language of terminal identification. Their use helps avoid improper connections and unsatisfactory operation or damage to equipment.

Here you can find standard rules for identifying terminals for

• Generators, a-c and d-c • Motors—capacitor, multi-speed, and other varieties • Transformers — power and distribution • Feeder Voltage Regulators • Industrial Control Apparatus • Instrument Transformers • Current-Limiting Reactors • Constant-Current Transformers of the Moving Type • Attachment Plugs • Electric Water Heaters

Quantity Prices On Request

American Standards Association
70 East 45th Street, New York 17

Please send me (check enclosed...... bill me......) ...... copies of American Standard C6.1-1956 at $1.00 per copy.

Name ....

Company ....

Street ....

City ....Zone ....State ......